Intel® Active Management Technology v5.0 Administrator's Guide

Overview

Menus and Defaults

Setup and Configuration

Management

AMT Redirection (SOL/IDE-R)

Troubleshooting

If you purchased a DELL™ n Series computer, any references in this document to Microsoft® Windows® operating systems are not applicable.

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October 2008 Rev. A00

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Overview

Intel® Active Management Technology (Intel AMT) allows companies to easily manage their networked computers.

- **Discover** computing assets on a network regardless of whether the computer is turned on or off – Intel AMT uses information stored in nonvolatile system memory to access the computer. The computer can even be accessed while it is powered off (also called out-of-band or OOB access).
- Remotely **repair** systems even after operating system failures – In the event of a software or operating system failure, Intel AMT can be used to access the computer remotely for repair purposes. IT administrators can also detect computer system problems easily with the assistance of Intel AMT's out-of-band event logging and alerting.
- **Protect** networks from incoming threats while easily keeping software and virus protection up to date across the network.

Software Support

Several independent software vendors (ISVs) are building software packages to work with Intel AMT features. This provides IT administrators many options when it comes to remotely managing the networked computer assets within their company.

Features and Benefits

Intel AMT	
Features	**Benefits**
Out-of-band (OOB) access	Allows remote management of platforms regardless of system power or operating system state
Remote troubleshooting and recovery	Significantly reduces desk side visits, increasing the efficiency of IT technical staff
Proactive alerting	Decreases downtime and minimizes repair times
Remote hardware and software asset tracking	Increases speed and accuracy over manual inventory tracking, reducing asset accounting costs
Third-party nonvolatile storage	Increases speed and accuracy over manual inventory tracking, reducing asset accounting cost

* Information on this page provided by Intel.

The Intel® Management Engine BIOS Extension (MEBx) is an optional ROM module provided to Dell™ from Intel that is included in the Dell BIOS. The MEBx has been customized for Dell computers.

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Operational Modes

Intel® AMT can be set up for either Enterprise or Small and Medium Business operational modes (also called provisioning models). Both operational modes support dynamic and static IP networking.

If you use dynamic IP networking (DHCP), the Intel AMT host name and the operating system host name must match. You must also configure both the operating system and Intel AMT to use DHCP as well.

If you use static IP networking, the Intel AMT IP address must be different from the operating system's IP address. Additionally, the Intel AMT hostname must be different from the operating system's hostname.

- **Enterprise mode** – This mode is for large organizations. This is an advanced networking mode that supports Transport Layer Security (TLS) and requires a configuration service. Enterprise mode allows IT administrators to set up and configure Intel AMT securely for remote management. The Dell™ computer is defaulted to Enterprise mode when it leaves the factory. The mode can be changed during the setup and configuration process.
- **Small Medium Business (SMB) mode** – This mode is a simplified operational mode that does not support TLS and does not require a setup application. SMB mode is for customers who do not have independent software vendor (ISV) management consoles or the necessary network and security infrastructures to use encrypted TLS. In SMB mode, Intel AMT setup and configuration is a manual process completed through the Intel ME BIOS Extension (MEBx). This mode is the easiest to implement since it does not require much infrastructure, but it is the least secure since all network traffic is not encrypted.

Intel AMT Configuration sets up all other Intel AMT options not covered in Intel AMT Setup, such as enabling the computer for Serial-Over-LAN (SOL) or IDE-Redirect (IDE-R).

You can change the settings modified in the configuration phase many times over the course of a computer's life span. You can make changes to the computer locally or through a management console.

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Setup and Configuration Overview

The following is a list of important terms related to the Intel® AMT setup and configuration.

- **Setup and configuration** — The process that populates the Intel AMT-managed computer with usernames, passwords, and network parameters that enable the computer to be administered remotely.
- **Provisioning** — The act of setting up and configuring Intel AMT.
- **Configuration service** — A third-party application that completes the Intel AMT provisioning.
- **Intel AMT WebGUI** — A Web browser-based interface for limited remote computer management.

You must set up and configure Intel AMT on a computer before using it. Intel AMT setup readies the computer for Intel AMT mode and enables network connectivity. This setup is generally performed only once in the lifetime of a computer. When Intel AMT is enabled, it can be discovered by management software over a network.

Once Intel AMT is set up in Enterprise mode, it is ready to initiate configuration of its own capabilities. When all required network elements are available, simply connect the computer to a power source and the network, and Intel AMT automatically initiates its own configuration. The configuration service (a third-party application) completes the process for you. Intel AMT is then ready for remote management. This configuration typically takes only a few seconds. When Intel AMT is set up and configured, you can reconfigure the technology as needed for your business environment.

Once Intel AMT is set up in SMB mode, the computer does not have to initiate any configuration across the network. It is set up manually and is ready to use with the Intel AMT Web GUI.

Intel AMT Setup and Configuration States

The act of setting up and configuring Intel AMT is also known as provisioning. An Intel AMT capable computer can be in one of three setup and configuration states:

- Factory-default state
- Setup state
- Provisioned state

The factory-default state is a fully unconfigured state in which security credentials are not yet established and Intel AMT capabilities are not yet available to management applications. In the factory-default state, Intel AMT has the factory-defined settings.

The setup state is a partially configured state in which Intel AMT has been set up with initial networking and transport layer security (TLS) information: an initial administrator password, the provisioning passphrase (PPS), and the provisioning identifier (PID). When Intel AMT has been set up, Intel AMT is ready to receive enterprise configuration settings from a configuration service.

The provisioned state is a fully configured state in which the Intel Management Engine (ME) has been configured with power options, and Intel AMT has been configured with its security settings, certificates, and the settings that activate the Intel AMT capabilities. When Intel AMT has been configured, the capabilities are ready to interact with management applications.

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Provisioning Methods

The act of setting up and configuring Intel® AMT is known as provisioning. There are three methods of provisioning a computer:

- Small Business
- Enterprise TLS-PKI
- Enterprise TLS-PSK

Transport Layer Security (TLS) is a protocol that provides secure communications on the Internet for such things as web browsing, e-mail, Internet faxing, instant messaging and other data transfers. TLS was a legacy method of configuring Intel AMT on an isolated network separate from the corporate network. A setup and configuration server (SCS) requires a secondary network connection to a certification authority (an entity which issues digital certificates) for TLS configuration.

Initially the computers are shipped in the factory-default state with Intel AMT ready for configuration and provisioning. These computers must go through Intel AMT setup in order to go from the factory-default state to the setup state. Once the computer is in the setup state, you can continue to configure it manually or connect it to a network where it connects with an SCS and begin Enterprise Mode Intel AMT configuration.

Small Business Mode

Small business mode is remains the same as from AMT v3.0 and basically means no security. Small business setup consists of just three steps:

1. Set the host name
2. Configure the TCP/IP settings
3. Set Provisioning Mode to "Small Business"

Enterprise Mode

TLS-PKI and TLS-PSK Intel AMT setup and configuration is usually performed in a company's IT department. The following are required:

- Setup and configuration server
- Network and security infrastructure

Intel AMT capable computers in the factory-default state are given to the IT department, which is responsible for Intel AMT setup and configuration. The IT department can use the methods described below to input Intel AMT setup information, after which the computers are in Enterprise Mode and in the In-Setup phase. An SCS must generate PID and PPS sets.

The Intel AMT configuration must occur over a network. The network can be encrypted using the Transport Layer Security Pre-Shared Key (TLS-PSK) protocol. Once the computers connect to an SCS, Enterprise Mode Configuration occurs.

Enterprise TLS-PKI

Enterprise TLS-PKI is also known as "Remote Configuration". The SCS uses TLS-PKI (Public Key Infrastructure) certificates to securely connect to an Intel AMT enabled computer. The certificates can be generated a few ways:

- The SCS can connect using one of the default certificates pre-programmed on the computer, as detailed in the MEBx interface section of this document.
- The SCS can create a custom certificate, which can be deployed on the AMT computer by means of a desk-side visit with a specially formatted USB thumb drive as detailed in the Configuration Service section of this document.
- The SCS could use a custom certificate which was pre-programmed at the Dell factory through the Custom Factory Integration (CFI) process.

Enterprise TLS-PSK

Enterprise TLS-PSK is also known as "One-Touch Configuration". The SCS uses PSK's (Pre-Shared Key's) to establish a secure connection with the AMT computer. These 52-character keys can be created by the SCS, and then deployed on the AMT

computer with a desk-side visit in one of two ways:

- The key can be manually typed into the MEBx.
- The SCS can create a list of custom keys, and put them onto a specially formatted USB thumb drive. Then each AMT computer retrieves a custom key from the specially formatted USB thumb drive during BIOS boot as detailed in the Configuration Service section of this document.

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MEBx Settings Overview

The Intel® Management Engine BIOS Extension (MEBx) provides platform-level configuration options for you to configure the behavior of Management Engine (ME) platform. Options include enabling and disabling individual features and setting power configurations.

This section provides details about MEBx configuration options and constraints, if any.

All the ME Platform Configuration setting changes are not cached in MEBx. They are committed to ME non-volatile memory (NVM) until you exit MEBx. Hence, if MEBx crashes, the changes made until that point are NOT going to be committed to ME NVM.

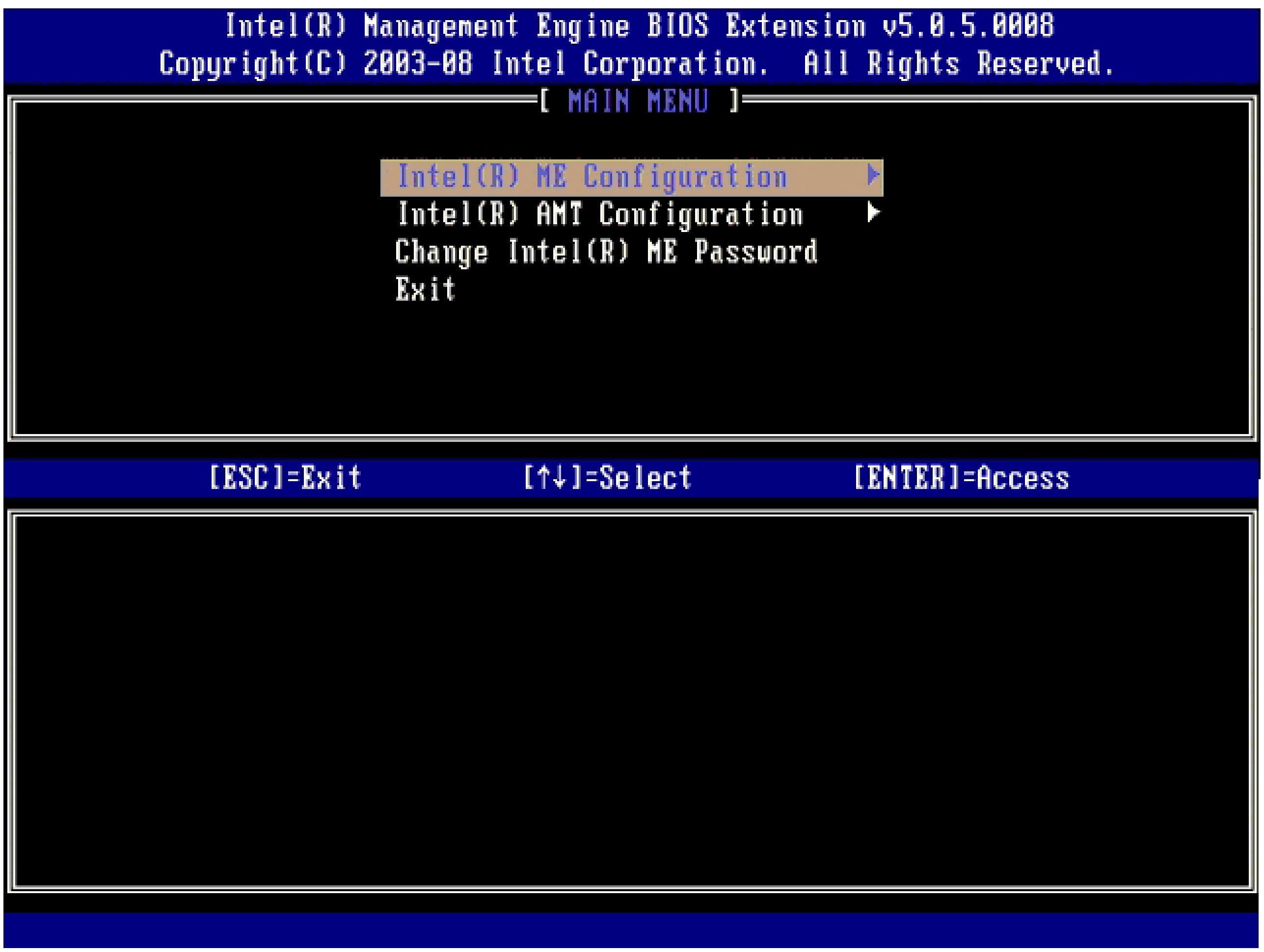
Access MEBx Configuration User Interface

The MEBx configuration user interface can be accessed on a computer through the following steps:

1. Turn on (or restart) your computer.
2. When the blue DELL™ logo appears, press <Ctrl><p> immediately.

   If you wait too long and the operating system logo appears, continue to wait until you see the Microsoft® Windows® desktop. Then shut down your computer and try again.
3. Type the ME password. Press <Enter>.

The MEBx screen appears as shown below.



The main menu presents three function selections:

- **Intel ME Configuration**

- **Intel AMT Configuration**
- **Change Intel ME Password**

The Intel ME Configuration and Intel AMT Configuration menus are discussed on the following pages. First, the password must be changed in order to proceed through these menus.

Changing the Intel ME Password

The default password is `admin` and is the same on all newly deployed platforms. You must change the default password before changing any feature configuration options.

The new password must include the following elements:

- Eight characters, no more than 32
- One uppercase letter
- One lowercase letter
- A number
- A special (nonalphanumeric) character, such as !, $, or ; excluding the :, ", and , characters.)

The underscore (_) and spacebar are valid password characters but do NOT add to the password complexity.

* Information on this page provided by Intel.

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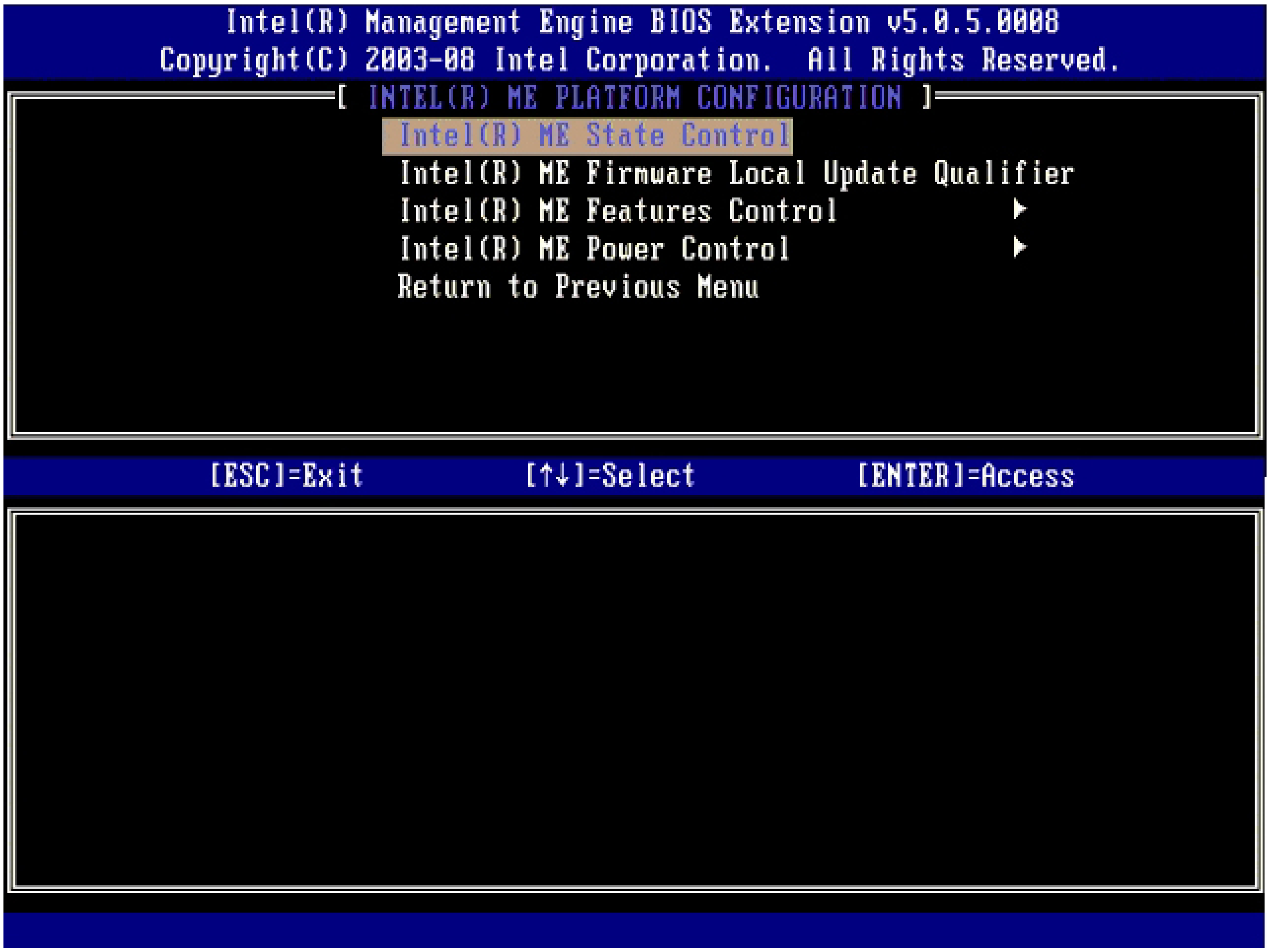
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ME Configuration Menu

To reach the **Intel® Management Engine (ME) Platform Configuration** page, follow these steps:

1. Under the Management Engine BIOS Extension (MEBx) main menu, select **ME Configuration**. Press <Enter>.
2. The following message appears:
   `System resets after configuration changes. Continue: (Y/N)`
3. Press <Y>.

The **ME Platform Configuration** page opens. This page allows you to configure the specific functions of the ME such as features, power options, and so on. Below are quick links to the various sections.



Intel ME State Control

When the **ME State Control** option is selected on the **ME Platform Configuration** menu, the **ME State Control** menu appears. You can disable ME to isolate the ME computer from main platform until the end of the debugging process.



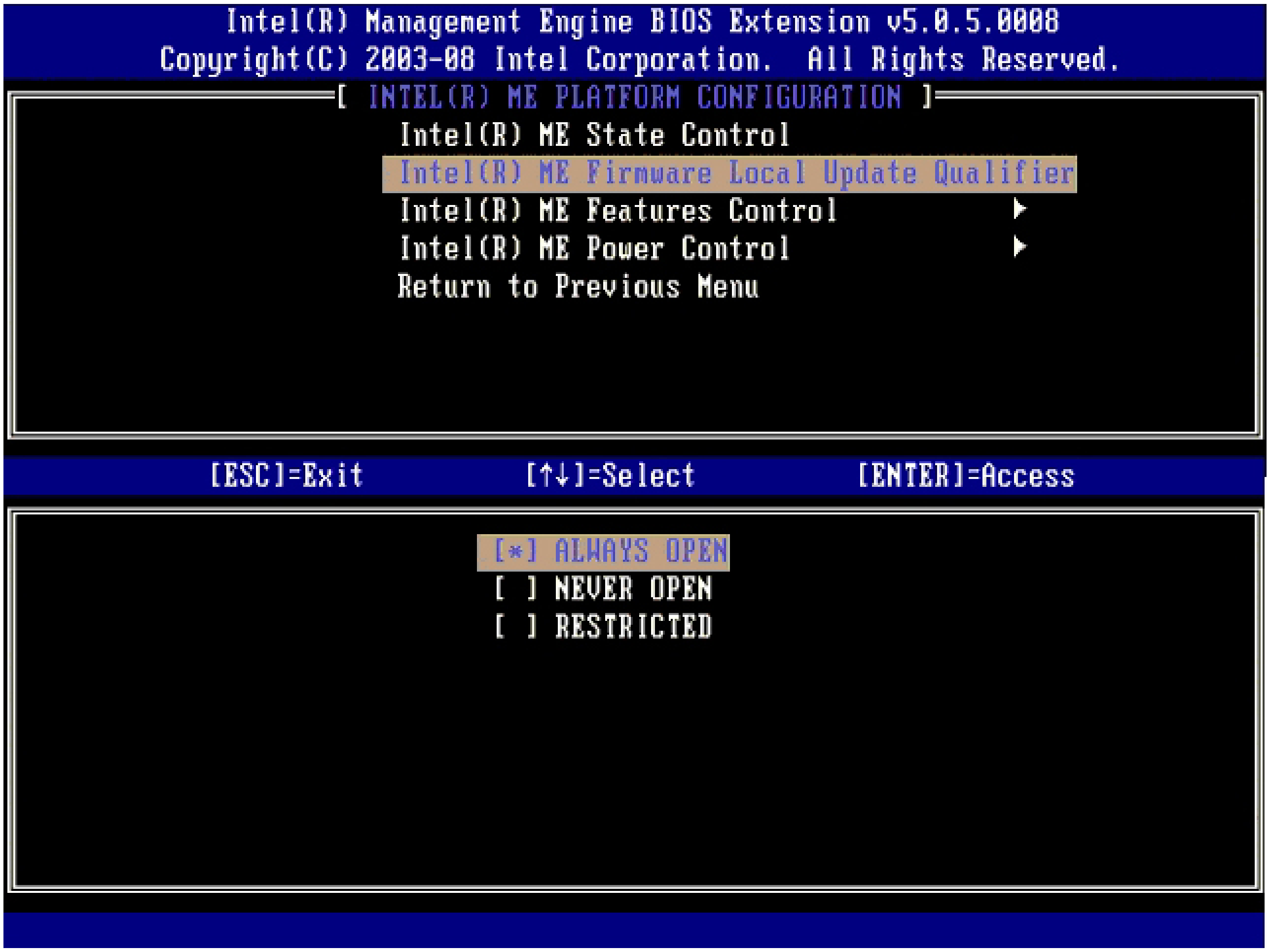
When enabled, the **ME State Control** option lets you disable ME to isolate the ME computer from the main platform while debugging a field malfunction. The table below illustrates the details of the options.

ME Platform State Control	
Option	**Description**
Enabled	Enable the Management Engine on the platform
Disabled	Disable the Management Engine on the platform

In fact, the ME is not really disabled with the **Disabled** option. Instead, it is paused at the very early stage of its booting so the computer has no traffic originating from the ME on any of its busses, ensuring that you can debug a computer problem without worrying about any role the ME might have played in it.

Intel ME Firmware Local Update Qualifier

This option on the **ME Platform Configuration** menu sets the policy for allowing the MEBx to be updated locally. The default setting is **Alway Open**. The other settings available are **Never Open** and **Restricted**.

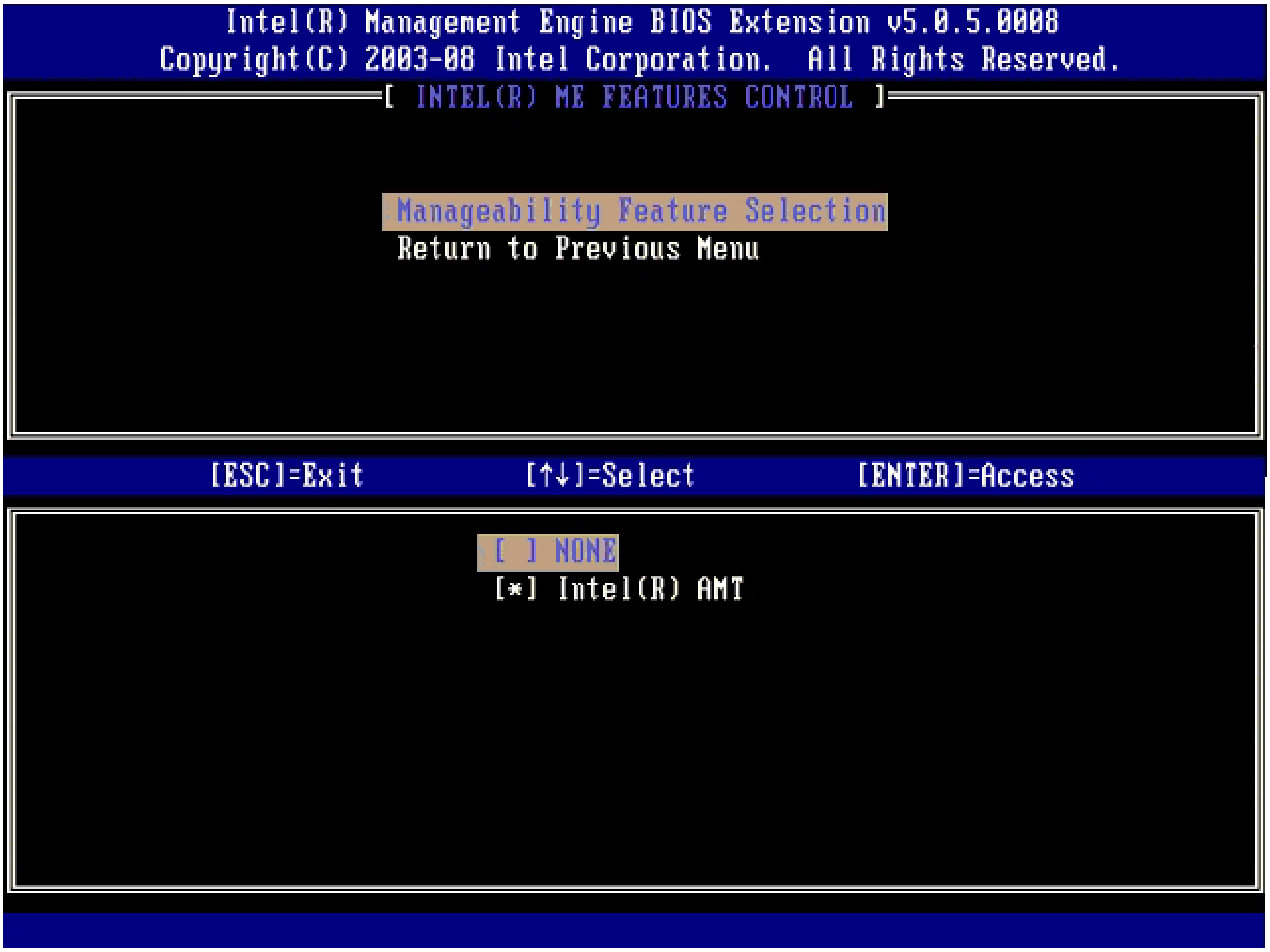


Intel ME Features Control

The **ME Features Control** menu contains the following configuration selection.

Manageability Feature Selection

When you select the **Manageability Feature Selection** option on the **ME Features Control** menu, the **ME Manageability Feature** menu appears.



You can use this option to determine which manageability feature is enabled.

- **None** — Choosing this option means that manageability will not be enabled. .
- **Intel AMT / Intel Standard Manageability** — Intel Active Management Technology (Intel AMT). If the system does not meet the minimum system requirements for Intel AMT, only Intel Standard Manageability will be selectable.

The table below explains these options.

Management Feature Select Option	
Option	**Description**
None	Manageability Feature is not selected
Intel AMT	Intel AMT manageability feature is selected

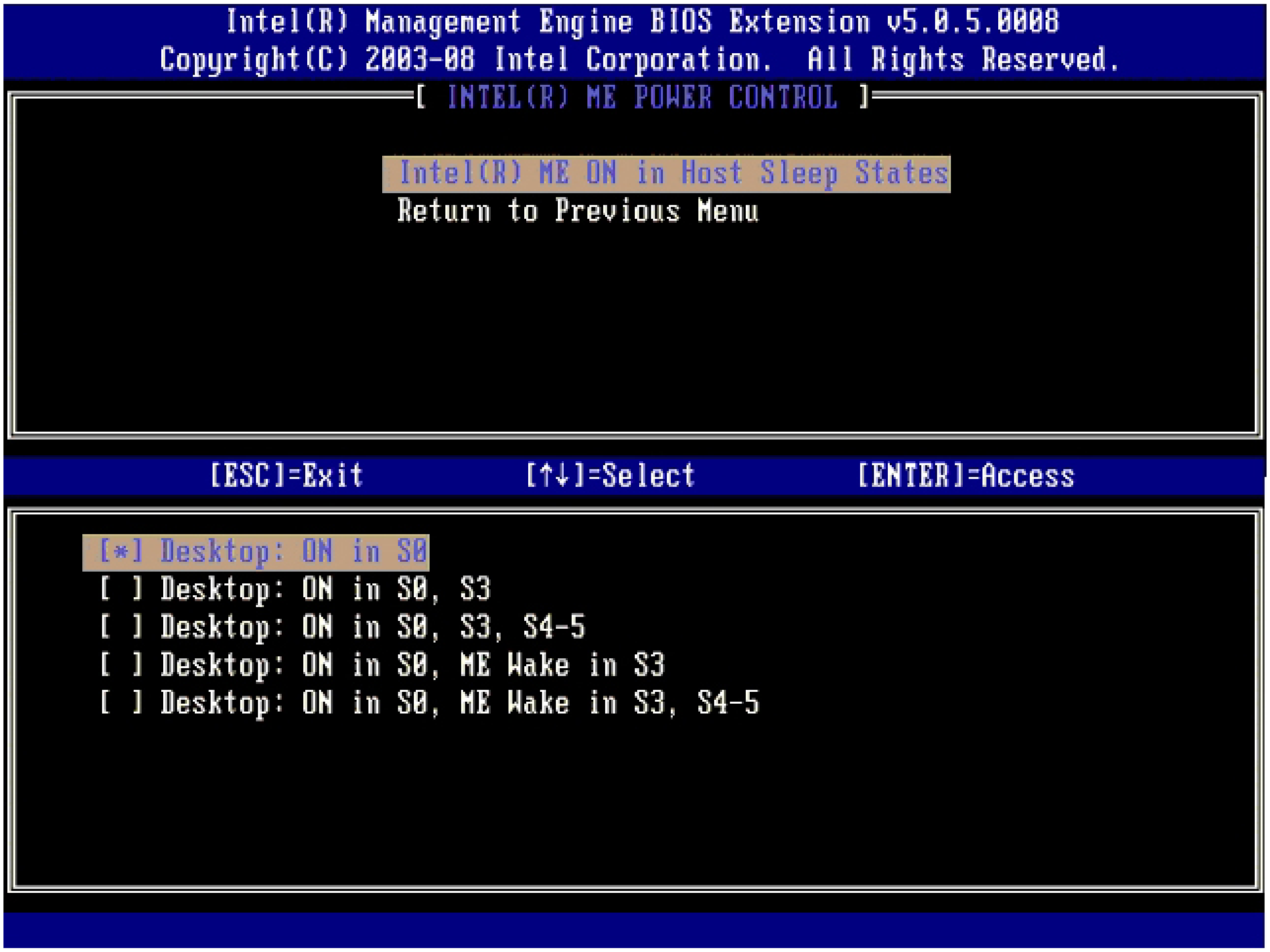
When the option is changed from **Intel AMT** to **None**, a warning message is displayed. If the user accepts the change from **Intel AMT** to **None**, Intel AMT will go through a full un-provision. If the **None** option is selected, there is no manageability feature provided by the Intel ME system, so management applications are not be able to use the Intel ME. However, Intel ME is still enabled (the Intel ME firmware is still running).

Intel ME Power Control

To comply with ENERGY STAR requirements, the Intel Management Engine can be turned off in various sleep states. **Intel ME Power Control** menu configures Intel ME platform power policies.

ME On in Host Sleep States

When the **ME ON in Host Sleep States** option is selected on the **ME Power Control** menu, the **ME in Host Sleep States** menu loads.



The power package selected determines when the ME is turned ON. The default power package is **Desktop: ON in S0**. The end user administrator can choose which power package is used depending on computer usage. The power package selection page can be seen above.

* Information on this page provided by Intel.

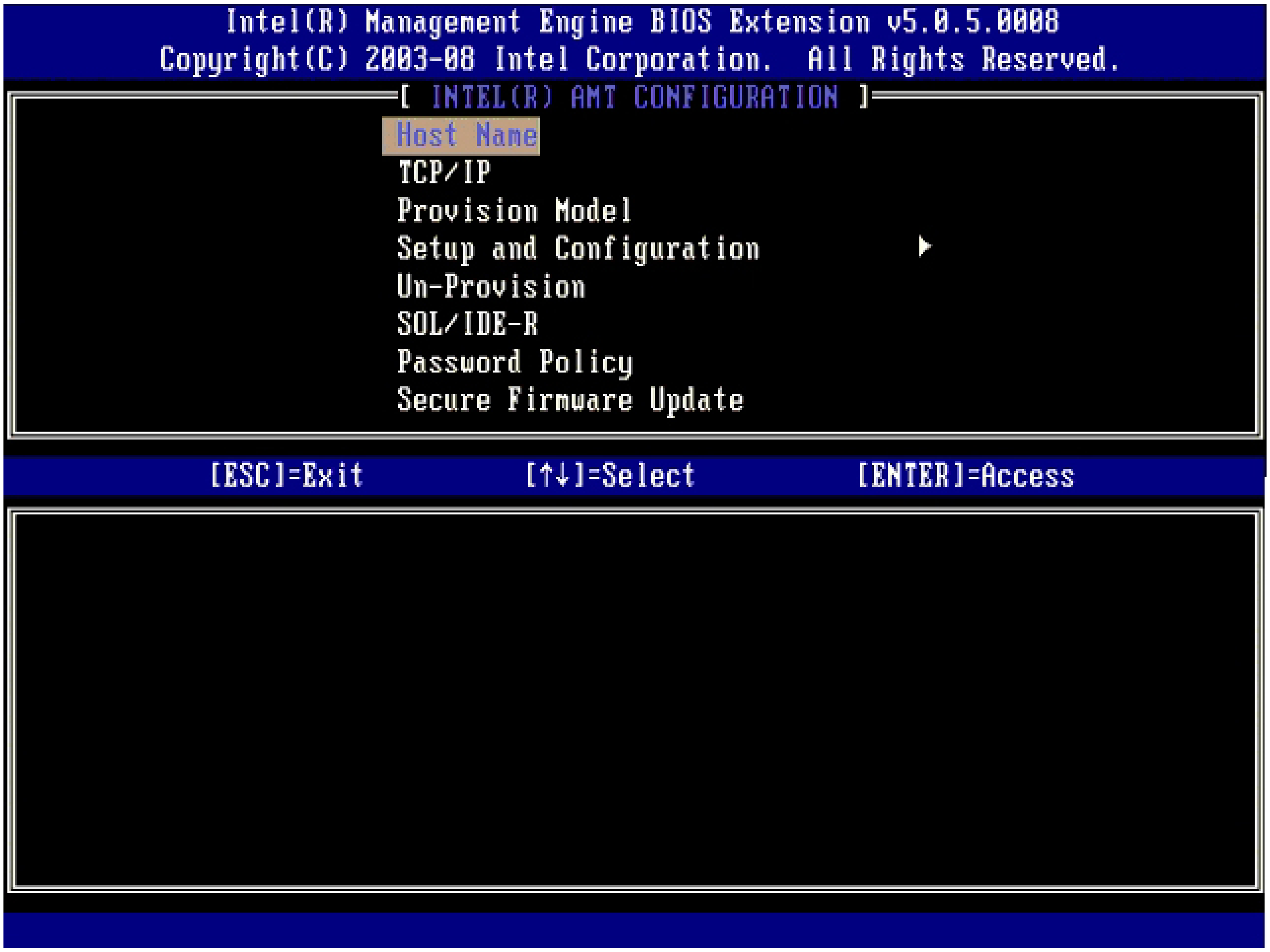
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AMT Configuration Menu

After you completely configure the Intel® Management Engine (ME) feature, you must reboot before configuring the Intel AMT for a clean system boot. The image below shows the **Intel AMT configuration** menu after a user selects the **Intel AMT Configuration** option from the **Management Engine BIOS Extension (MEBx)** main menu. This feature allows you to configure an Intel AMT capable computer to support the Intel AMT management features.

You need to have a basic understanding of networking and computer technology terms, such as TCP/IP, DHCP, VLAN, IDE, DNS, subnet mask, default gateway, and domain name. Explaining these terms is beyond the scope of this document.



The **Intel AMT Configuration** page contains the user-configurable options listed below.

For images of these menu options, refer to the "Enterprise Mode Setup" and "SMB Mode Setup" pages of this document.

Menu Options

- Host Name
- TCP/IP
- Provision Model
- Setup and Configuration
- Un-Provision
- SOL/IDE-R
- Password Policy
- Secure Firmware Update
- Set PRTC
- Idle Timeout

Host Name

A hostname can be assigned to the Intel AMT capable computer. This is the host name of the Intel AMT-enabled computer. If Intel AMT is set to DHCP, the host name MUST be identical to the operating system machine name.

TCP / IP

Allows you to change the following TCP/IP configuration of Intel AMT.

- **DHCP Mode** – ENABLE** / DISABLED
  If DHCP Mode is enabled, TCP/IP settings are configured by a DHCP server.

If a system is in static mode the system may require a second IP address. This IP address, often called the ME IP address may be different from the host IP address.

- **IP address** – Internet address of the Intel Management Engine.
- **Subnet mask** – The subnet mask used to determine what subnet IP address belongs to.
- **Default Gateway address** – The default gateway of the Intel Management Engine.
- **Preferred DNS address** – Preferred domain name server address.
- **Alternate DNS address** – Alternate domain name server address.
- **Domain name** – Domain name of the Intel Management Engine.

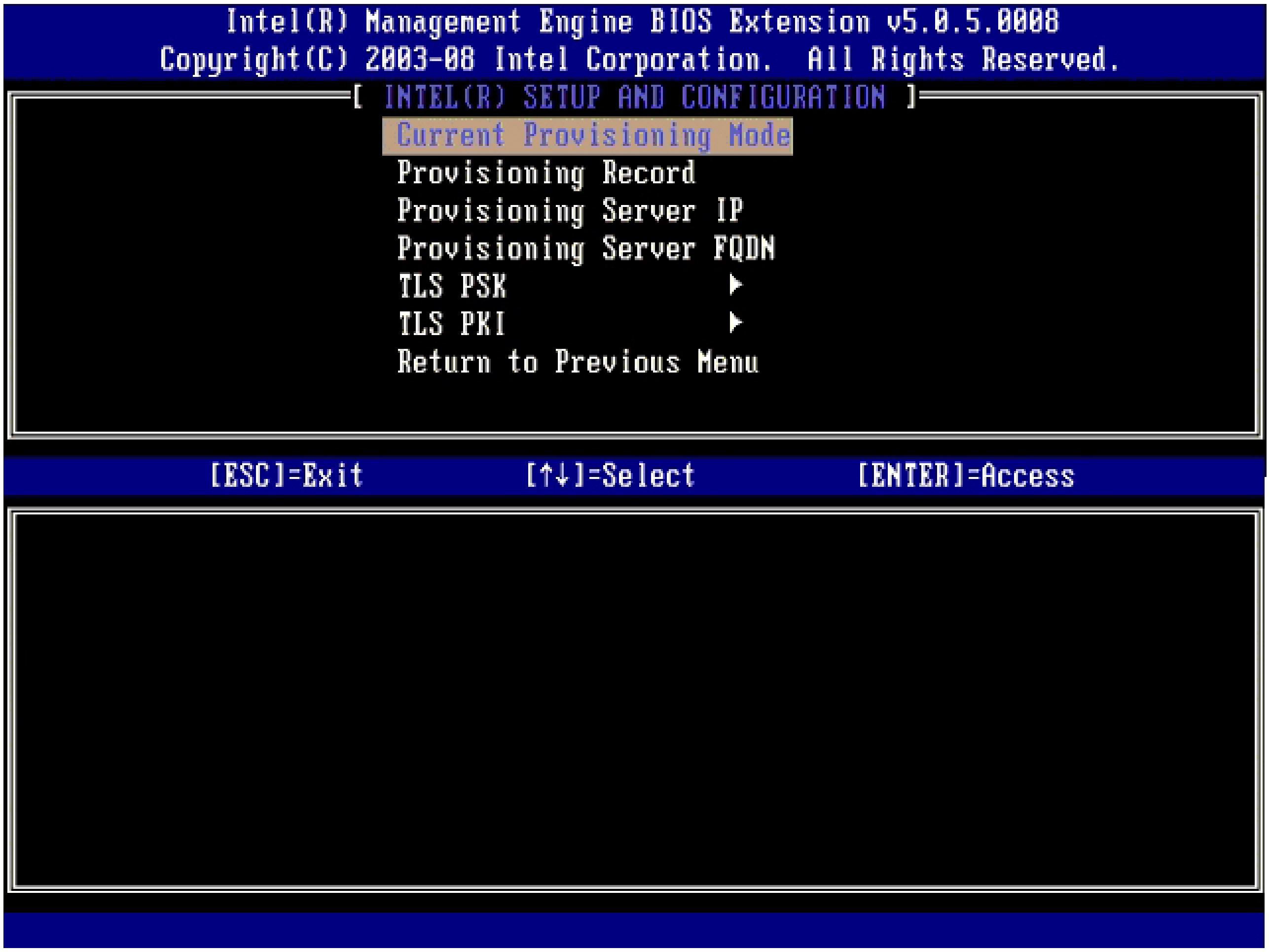
Provision Model

The following provisioning models are available:

- **Provisioning Mode** – Enterprise** / Small Business
  This allows you to select between small business and enterprise mode. Enterprise mode may have different security settings than Small Business mode. Because of the different security settings, each of these modes requires a different process to complete the setup and configuration process.

Setup and Configuration

The menu contains the parameters for the setup and configuration server. This menu also contains the security settings for PSK and PKI configurations.



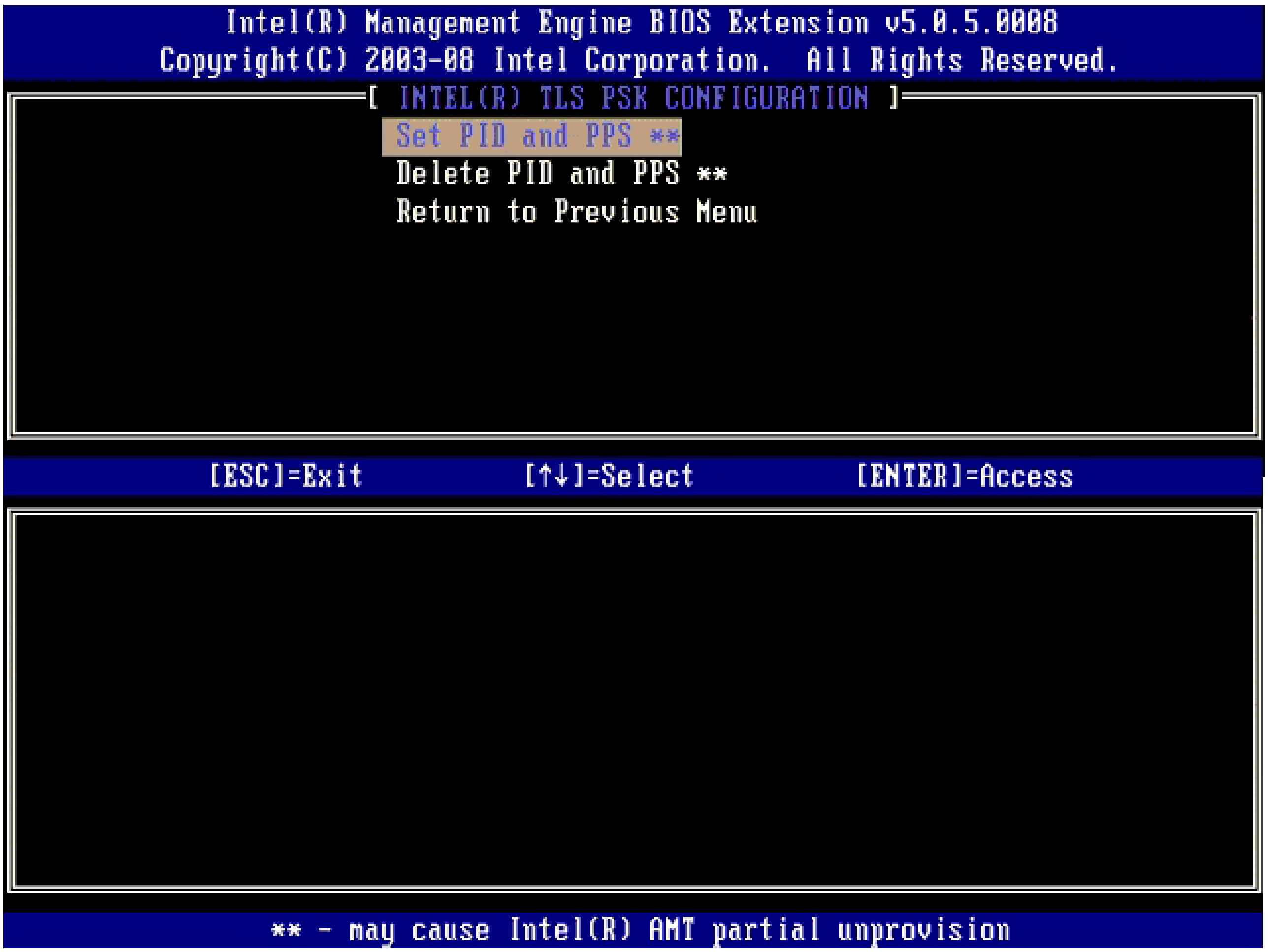
- **Current Provisioning Mode** – Displays the current provisioning TLS Mode: None, PKI, or PSK. This configuration is only shown in Enterprise Provision Model.
- **Provisioning Record** – Displays the provision PSK/PKI record data of the computer. If the data has not been entered, the MEBX displays a message that states "Provision Record not present". If the data is entered, the **Provision Record** displays the following:
  - **TLS provisioning mode** – Displays the current configuration mode of the computer: None, PSK or PKI.
  - **Provisioning IP** – The IP of the setup and configuration server.
  - **Date of Provision** – Displays the date and time of the provisioning in the format MM/DD/YYYY at HH:MM.
  - **DNS** – Displays if Secure DNS is being used or not. 0 indicates DNS is not in use, 1 indicates secure DNS is being used (PKI only).
  - **Host Initiated** – Displays if the setup and configuration process was initiated by the host: 'No' indicates the setup and configuration process was not host initiated; 'Yes' indicates the setup and configuration process was host initiated (PKI only).
  - **Hash Data** – Displays the 40 character certificate hash data (PKI only).
  - **Hash Algorithm** – Describes the hash type. Currently only SHA1 is supported (PKI only).
  - **IsDefault** – Displays 'Yes' if the Hash algorithm is the default algorithm selected. Displays 'No' if the hash algorithm is not the default algorithm used (PKI only).
  - **FQDN** – FQDN of the provisioning server mentioned in certificate (PKI only).
  - **Serial Number** – The 32 character that indicate the Certificate Authority serial numbers.
  - **Time Validity Pass** – Indicates whether the certificate passed the time validity check.
- **Provisioning Server IP** – The IP address and port number (0 – 65535) for an Intel AMT provisioning server. This configuration is only shown for the enterprise provision model. The default port number is 9971.
- **TLS PSK** – Contains the settings for TLS PSK configuration settings.
  - **Set PID and PPS** – Sets the provisioning identifier (PID) and provisioning passphrase (PPS). Enter the PID and PPS in the dash format. (Ex. PID: 1234-ABCD ; PPS: 1234-ABCD-1234-ABCD-1234-ABCD-1234-ABCD) NOTE - A PPS value of ' '0000-0000-0000-0000-0000-0000-0000-0000' does not change the setup configuration state. If this value is used the setup and configuration state stays as 'Not-started'.
  - **Delete PID and PPS** – Deletes the current PID and PPS stored in ME. If there is no PID and PPS entered, the MEBX returns an error message. Using this option does NOT set the setup and configuration process parameter to "Not Started." This option sets the setup and configuration process parameter to "In Process."
- **TLS PKI** – Contains the settings for the TLS PKI configuration settings.
  - **Remote Configuration Enable/Disable** – Disables or enables remote configuration. If this option is not enabled, remote configuration cannot occur.
  - **Manage Certificate Hashes** – Displays the list of hashes that are currently stored and the current status. To

change the active status of the certificate press the <+> key. To delete the hash press the <del> key. To add another key press the <ins> key.
  - **Set FQDN** – Sets the fully qualified domain name for the computer.
  - **Set PKI DNS suffix** – Sets the PKI DNS suffix.

TLS PSK

The submenu contains the settings for TLS PSK configuration settings. Setting or deleting the PID/PPS causes a partial un-provision if the setup and configuration is "In-process".

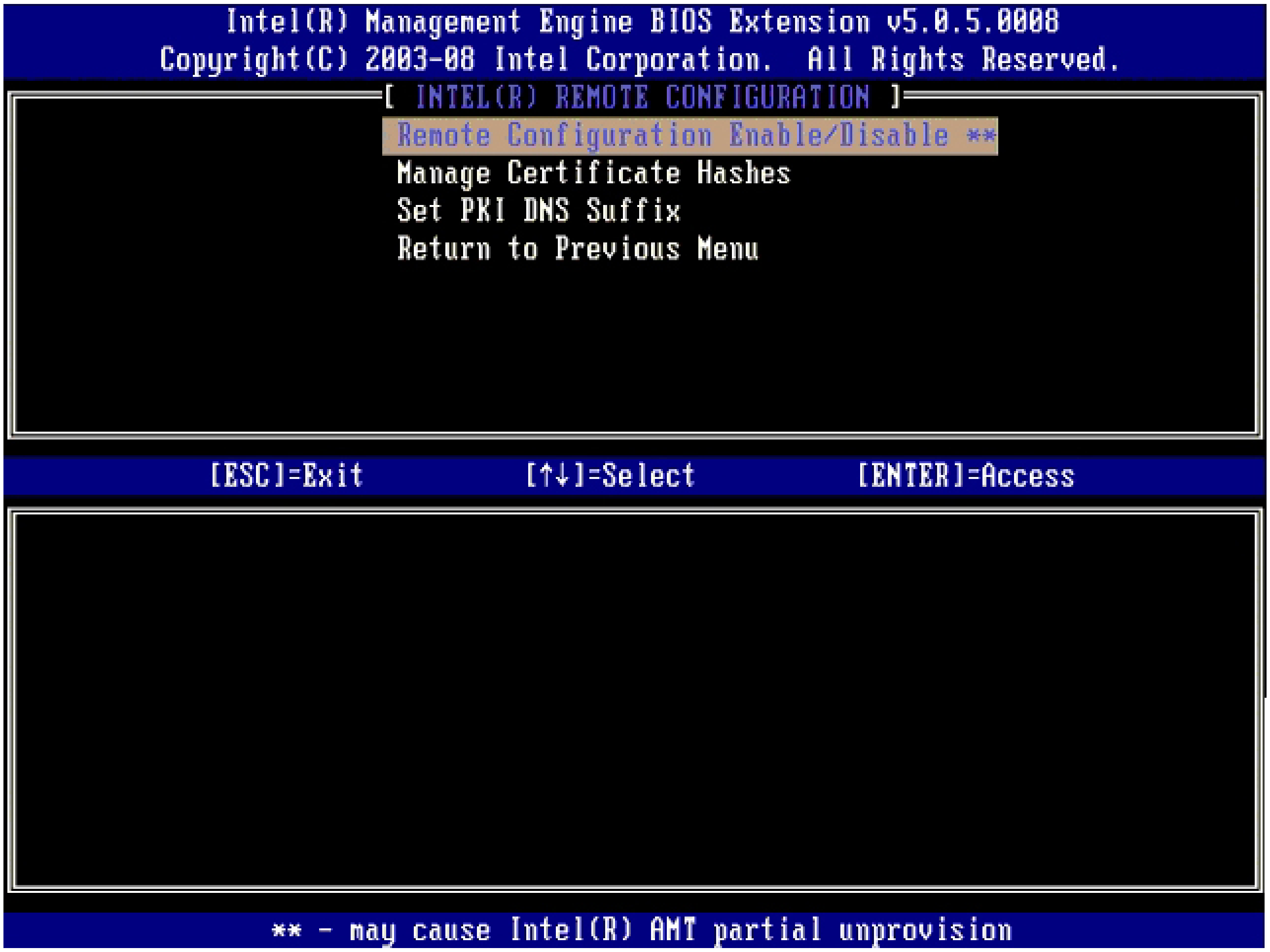
- **Set PID and PPS** – Sets the PID and PPS. Enter the PID and PPS in the dash format. (Ex. PID: 1234-ABCD ; PPS: 1234-ABCD-1234-ABCD-1234-ABCD-1234-ABCD) A PPS value of '0000-0000-0000-0000-0000-0000-0000-0000' does not change the setup configuration state. If this value is used the setup and configuration state stays as "Not-started."
- **Delete PID and PPS** – Deletes the current PID and PPS stored in ME. If there is no PID and PPS entered, the MEBX returns an error message.



TLS PKI – Remote Configuration Settings

The remote configuration options are contained under the TLS PKI sub menu. There are four remote configuration items:

- Remote Configuration Enable/Disable
- Manage Certificate Hashes
- Set FQDN
- Set PKI DNS Suffix



Remote Configuration Enable / Disable

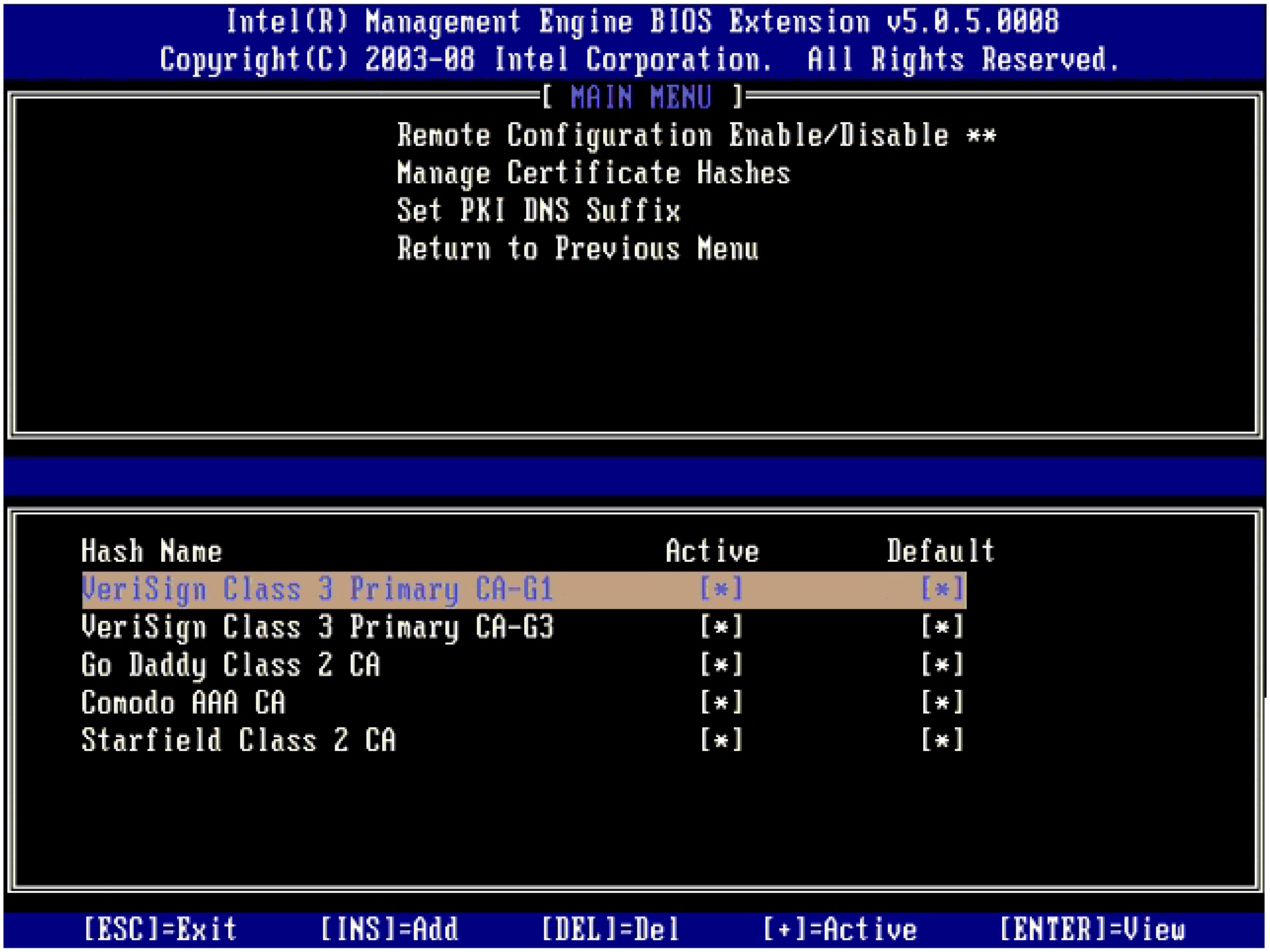
The selectable options are **Enable** and **Disable**. If **Remote Configuration** is disabled, the menu options underneath are still displayed, but cannot be used until **Remote Configuration** is enabled.

This option cannot be modified once the setup and configuration process is in process. This parameter can only be modified while the computer is in the factory default or un-provisioned state.

Enabling/disabling remote configuration causes a partial un-provision if the setup and configuration is **In-process**.

Manage Certificate Hashes

Select the **Manage Certificate Hashes** option under the **Remote Configuration** menu to display the **Manage Certificate Hashes** menu. Five default hashes are available from the factory. Hashes can be deleted or added as needed.



The **Manage Certificate Hash** screen has several keyboard controls available to you to manage the hashes on the computer. The following keys are valid when in the **Manage Certificate Hash** menu:

- **Escape key** – Exits from the menu
- **Insert key** – Adds a customized certificate hash to the computer
- **Delete key** – Deletes the currently selected certificate hash from the computer
- **<+> key** – Changes the active state of the currently selected certificate hash
- **Enter key** – Displays the details of the currently selected certificate hash

Adding a Customized Hash

1. Press <Insert> in the **Manage Certificate Hash** screen. A text field is displayed requesting the hash name.
2. You must enter the hash name. The hash name must be a maximum of 32 characters. Upon pressing <Enter> you are prompted to enter the certificate hash value.
3. The certificate hash value is a 20 byte hexadecimal number. You must enter the hash data in the correct format or the message `Invalid Hash Certificate Entered - Try Again` is displayed. Upon pressing <Enter> you are asked about setting the active state of the hash.
4. This query allows for setting the active state of the customized hash.
   - **Yes** – The customized hash is be marked as active.
   - **No** (Default) – VA_Hash is be maintained within EPS.

Deleting a Hash

1. Press <Delete> in the **Manage Certificate Hash** screen to display the
   `Delete this certificate hash? (Y/N)`
   prompt.
2. This option allows deleting of the selected certificate hash.
   - **Yes** – MEBx shall send the message to FW to delete the selected hash.
   - **No** – MEBx shall not delete the selected hash and returns to the **Remote Configuration**.

Changing the Active State

Press the <+> key in the **Manage Certificate Hash** screen to display the

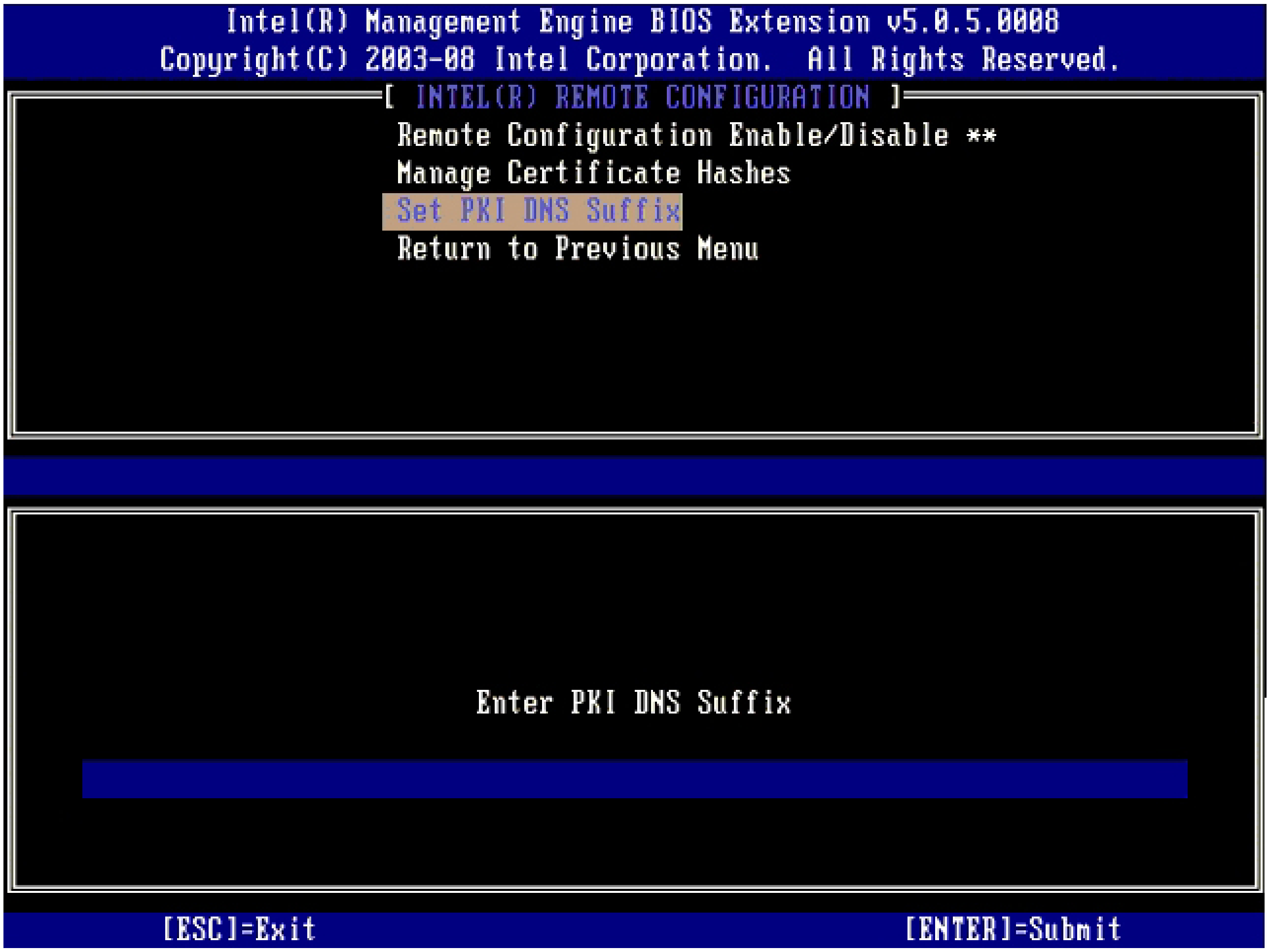
`Change the active state of this hash? (Y/N)`
prompt. Answering yes to this question toggles the active state of the currently selected certificate hash. Setting a hash as active indicates that the hash is available to use during PSK provisioning.

Viewing a Certificate Hash

Press <Enter> in the **Manage Certificate Hash** screen. The details of the selected certificate hash are displayed to include: the hash name, the certificate hash data, and the active and default states.

Set PKI DNS Suffix

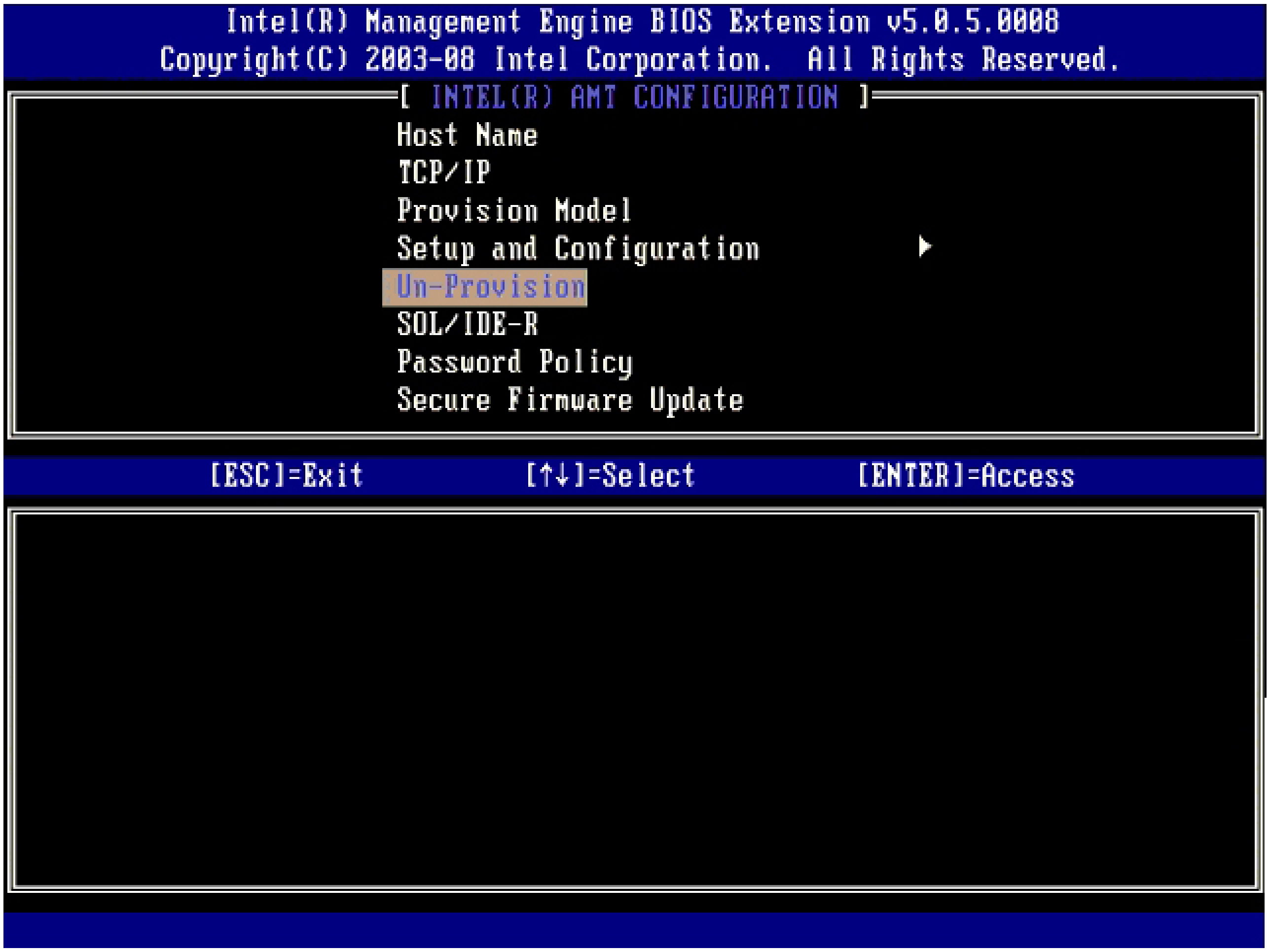
When the **Set PKI DNS Suffix** option is selected under the **Remote Configuration** menu, you are prompted to enter the **PKI DNS Suffix** of the Provisioning Server. The Key Value is maintained in EPS.



Un-provision

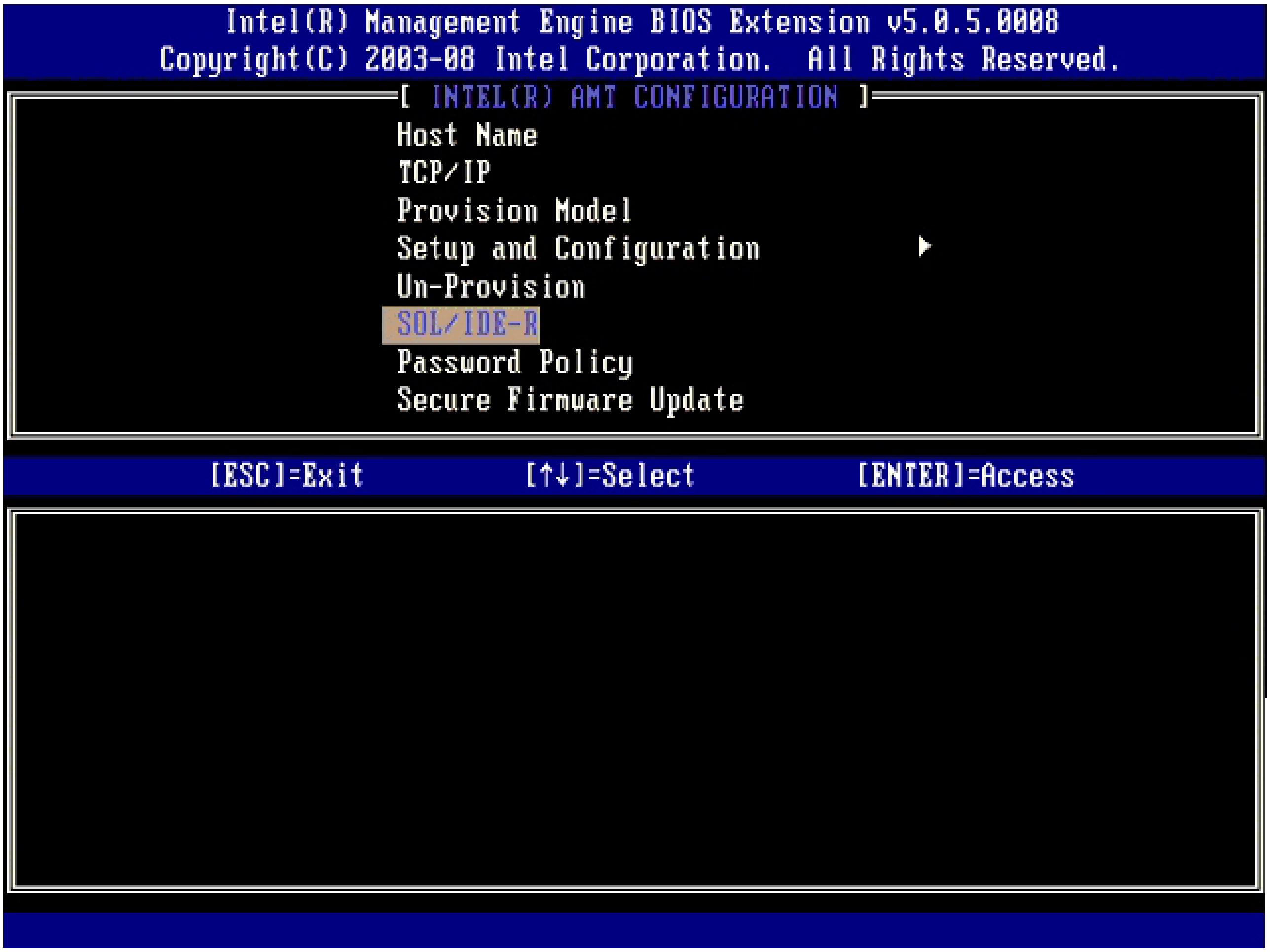
The **Un-Provision** option allows you to reset the Intel AMT configuration to factory defaults. There are three types of un-provision:

- Partial Un-provision – This option resents all the Intell AMT settings to their default values, but will not change the PID/PPS or the MEBx password.
- **Full Un-provision** – This option resets all of the Intel AMT settings to their default values. If a PID/PPS value is present, both values are erased. The MEBx password is not changed.
- **CMOS clear** – This un-provision option is not available in the MEBx. This option clears all values to their default values. If a PID/PPS is present, both values are lost. The MEBx password resets to the default value (admin). To invoke this option, you need to clear the CMOS (i.e. system board jumper).



SOL/IDE-R

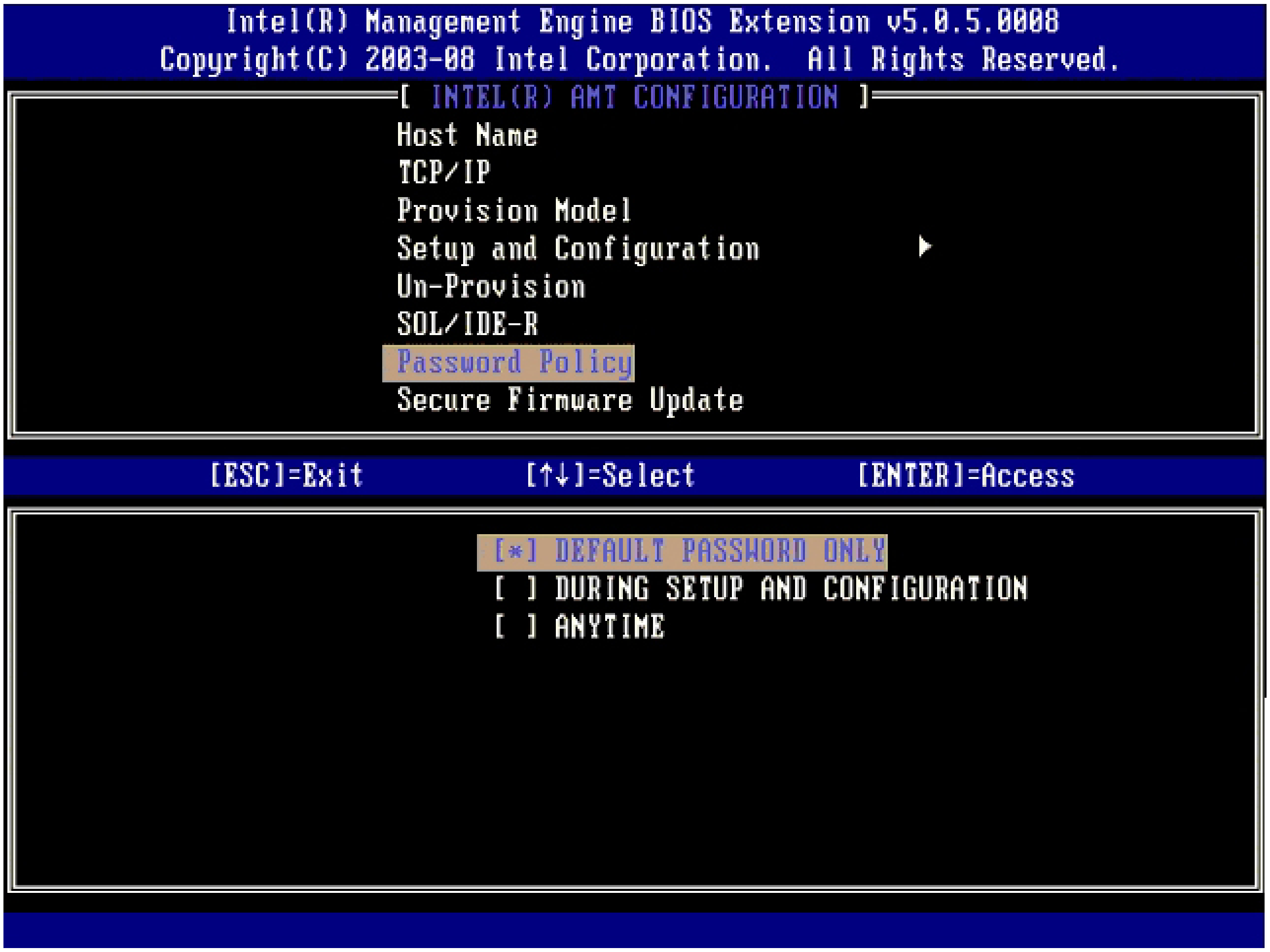
- **Username and Password** – DISABLED** / ENABLED
  This option provides the user authentication for SOL/IDER session. If the Kerberos protocol is used, set this option to **Disabled** and set the user authentication through Kerberos. If Kerberos is not used, you have the choice to enable or disable user authentication on the SOL/IDER session.
- **Serial-Over-LAN (SOL)** – DISABLED** / ENABLED
  SOL allows the Intel AMT managed client console input/output to be redirected to the management server console (if the client system supports SOL). If the system does not support SOL, this value cannot enable it.
- **IDE Redirection (IDE-R)** – DISABLED** / ENABLED
  IDE-R allows the Intel AMT managed client to be booted from remote disk images at the management console. If the client system does not support IDE-R, this value cannot enable it.



Password Policy

This option determines when the user is allowed to change the MEBx password through the nework. Note: The MEBx password can always be changed via the MEBx user interface. The options are:

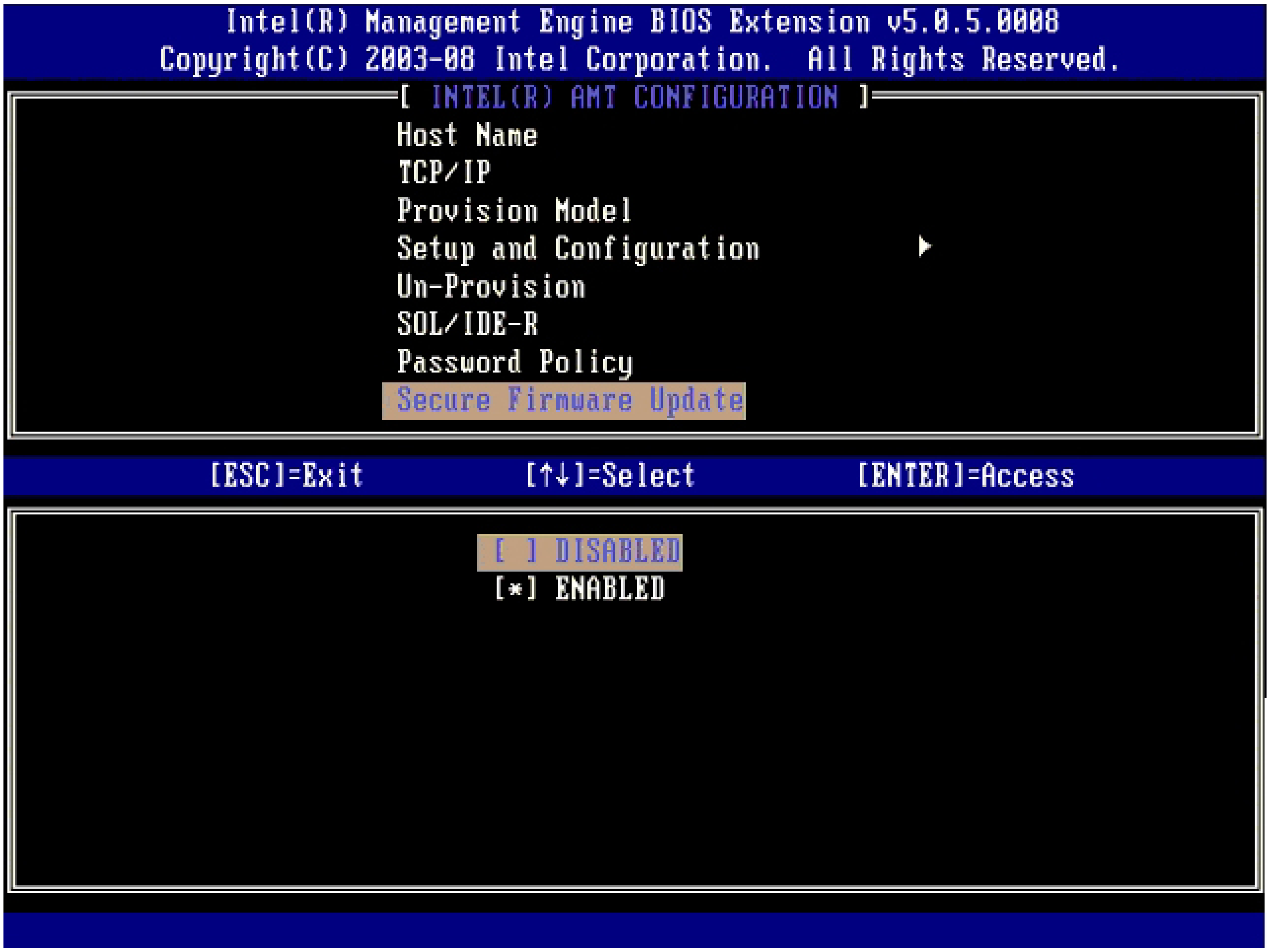
- **Default Password Only** – The MEBx password can be changed through the network interface if the default password has not been changed yet.
- **During Setup and Configuration** – The MEBX password can be changed through the network interface during the setup and configuration process but at no other time. Once the setup and configuration process is complete, the MEBx password cannot be changed via the network interface.
- **Anytime** – The MEBX password can be changed through the network interface at any time.



Secure Firmware Update

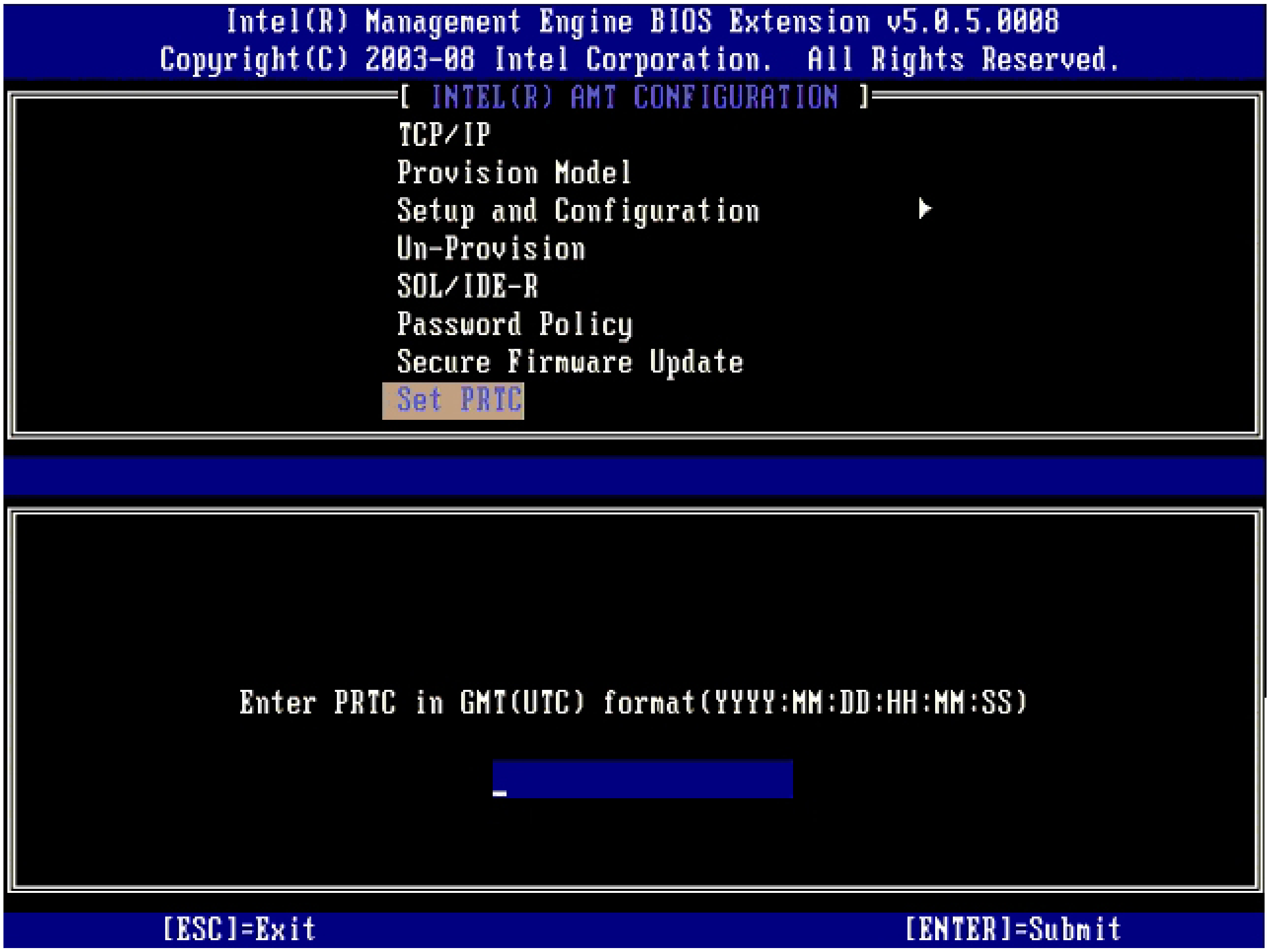
This option allows you to enable/disable secure firmware updates. **Secure firmware update** requires an administrator user name and password. If the administrator user name and password are not supplied, the firmware cannot be updated.

When the **secure firmware update** feature is enabled, you are able to update the firmware using the secure method. Secure firmware updates pass through the LMS driver. If secure and local firmware update is disabled, the user must enable secure firmware update or local firmware update to allow the firmware updates.



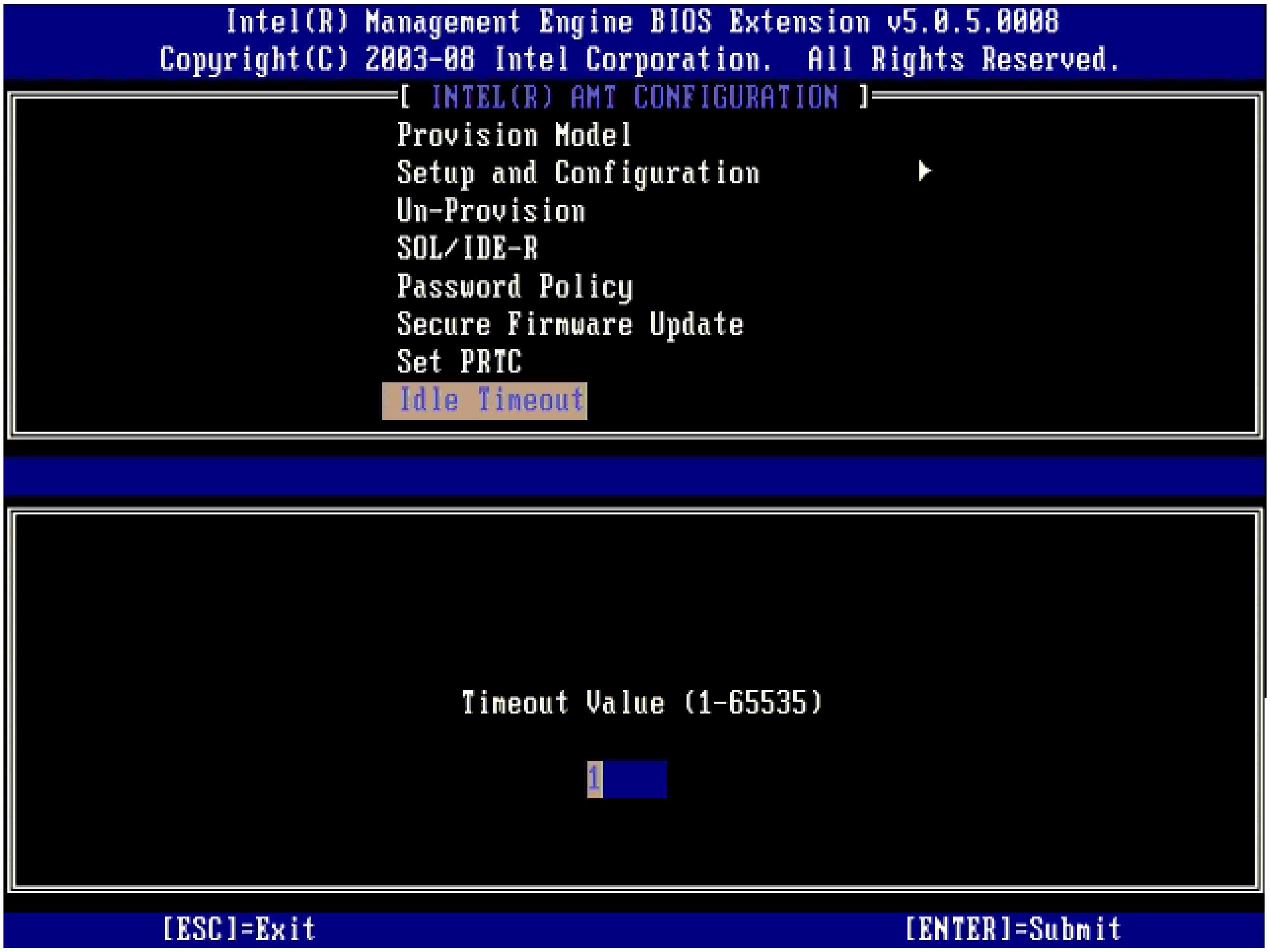
Set PRTC

Enter PRTC in GMT (UTC) format (YYYY:MM:DD:HH:MM:SS). Valid date range is 1/1/2004 – 1/4/2021. Setting PRTC value is used for virtually maintaining PRTC during power off (G3) state. This configuration is only displayed for the Enterprise Provision Model.



Idle Timeout

This setting is used to enable the Intel ME Wake on LAN feature and to define the Intel ME idle timeout in M1 state. The value should be entered in minutes. The value indicates the amount of time that the Intel ME is allowed to remain idle in M1 before transitioning to the M-off state. If the Intel ME is M0, it will not transition to M-off.



Intel AMT in DHCP Mode Settings Example

The table below shows a basic field settings example for the **Intel AMT Configuration** menu page to configure the computer in DHCP mode.

Intel AMT Configurations Example in DHCP Mode	
Intel AMT Configuration Parameters	**Values**
Intel AMT Configuration	Select and press <Enter>.
Host Name	Example: IntelAMT This is the same as the operating system machine name.
TCP/IP	Set the parameters as follows: • Enable **Network interface** • Enable **DHCP Mode** • Set a domain name (e.g., amt.intel.com)
Provision Model	• **Intel AMT 4.0 Mode** • **Small Business**
SOL/IDE-R	• Enable **SOL** • Enable **IDE-R**
Remote FW Update	Enabled

Save and exit MEBx and then boot the computer to the Windows® operating system.

Intel AMT in Static Mode Settings Example

The table below shows a basic field settings example for the **Intel AMT Configuration** menu page to configure the computer in static mode. The computer requires two MAC addresses (GBE MAC address and Manageability MAC Address) to operate in static mode. If there is no Manageability MAC address, Intel AMT cannot be set in static mode.

Intel AMT Configurations Example in Static Mode	
Intel AMT Configuration Parameters	**Values**
Intel AMT Configuration	Select and press <Enter>
Host Name	Example: IntelAMT
TCP/IP	Set the parameters as follows: • Enable **Network interface** • Disable **DHCP Mode** • Set an IP address (e.g., 192.168.0.15) • Set a subnet mask (e.g., 255.255.255.0) • The default gateway address is optional • The preferred DNS address is optional • The Alternate DNS address is optional • Set the domain name (e.g., amt.intel.com)
Provision Model	• **Intel AMT 4.0 Mode** • **Small Business**
SOL/IDE-R	• Enable **SOL** • Enable **IDE-R**
Remote FW Update	Enabled

Save and exit MEBx and then boot computer to the Windows operating system.

* Information on this page provided by Intel.

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Intel® Fast Call

Intel® Fast Call for help is a feature that is available for VPro SKUs. An Intel Fast Call for help connection allows the end user to request assistance if the VPro system is outside the corporate network. If the BIOS allows an Intel Fast Call for help connection the user can press the hot key/button (<Ctrl><h>) while the system is loading to initiate an Intel Fast Call connection.

Requirements

Before an Intel Fast Call connection can be established from the Operating System the VPro system must have:

1. Environment detection enabled
2. Remote Connection policy
3. Management Presence Server (MPS)

Putting it all Together

There are no settings in the MEBX to enable/disable Intel Fast Call for help. If the system supports Full VPro Intel Fast Call for help will be available for use. If the system only supports Intel Standard Manageability Intel Fast call for help is not enabled.

1. Before an Intel Fast Call for help can be started, environment detection must be enabled. This allows Intel AMT to determine if the system is within the corporate network. This is configured through an ISV app.
2. A remote connection policy must be created before an Intel Fast call for help can be initiated. The policy for the BIOS initiated call does not need to be configured, but another policy must exist before initiating a help call from the BIOS. The BIOS must support the hot key that initiates the Intel Fast call for help.
3. A management presence server must exist to answer the Intel fast calls for help. The management presence server resides in the DMZ zone. The management presence server.

When all of these conditions are satisfied the system is able to initiate an Intel Fast Call for help.

Initiating Intel Fast Call for Help

Once the feature has been fully configured, there are three methods for initiating an Intel Fast Call for help session. These include:

- At the Dell splash screen press <Ctrl><h>.
- At the Dell splash screen press <F12> for the One Time Boot Menu.
  - Select the last option titled **Intel Fast Call for Help**.
- From Windows:
  1. Launch the Intel AMT privacy icon/application **Intel Management Security Status**.
  2. Switch to the **Intel AMT** tab.
  3. In the **Remote Connectivity** box, click **Connect**.

* Information on this page provided by Intel.

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Setup and Configuration Methods Overview

As discussed in the **Setup and Configuration Overview** section, the computer has to be configured before the Intel AMT capabilities are ready to interact with management application. There are two methods to complete the provisioning process (in order from least complex to most complex):

- **Configuration service** — A configuration service allows you to complete the provisioning process from a GUI console on their server with only one touch on each of the Intel AMT capable computers. The PPS and PID fields are completed using a file created by the configuration service saved to a USB mass storage device.
- **MEBx interface** — The IT administrator manually configures the Management Engine BIOS Extension (MEBx) settings on each Intel AMT ready computer. The PPS and PID fields are completed by typing the 32 character and 8 character alpha-numeric keys created by the configuration service into the MEBx interface.

Details on using these various methods are available in the next few sections.

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Configuration Service--Using a USB Device

This section discusses Intel® AMT setup and configuration using a USB storage device. You can set up and locally configure password, provisioning ID (PID), and provisioning passphrase (PPS) information with a USB drive key. This is also called USB provisioning. USB provisioning allows you to manually set up and configure computers without the problems associated with manually typing in entries.

USB provisioning only works if the MEBx password is set to the factory default of `admin`. If the password has been changed, reset it to the factory default by clearing the CMOS.

The following is a typical USB drive key setup and configuration procedure. For a detailed walk-through using Altiris® Dell™ Client Manager (DCM), refer to the USB device procedure page.

1. An IT technician inserts a USB drive key into a computer with a management console.
2. The technician requests local setup and configuration records from a setup and configuration server (SCS) through the console.
3. The SCS does the following:
    1. Generates the appropriate passwords, PID, and PPS sets
    2. Stores this information in its database
    3. Returns the information to the management console
4. The management console writes the password, PID, and PPS sets to a **setup.bin** file in the USB drive key.
5. The technician takes the USB drive key to the staging area where new Intel AMT capable computers are located. The technician then does the following:
    1. Unpacks and connects computers, if necessary
    2. Inserts the USB drive key into a computer
    3. Turns on that computer
6. The computer BIOS detects the USB drive key.
    - If found, the BIOS looks for a **setup.bin** file at the beginning of the drive key. Go to step 7.
    - If no USB drive key or **setup.bin** file is found, then restart the computer. Ignore the remaining steps.
7. The computer BIOS displays a message that automatic setup and configuration will occur.
    1. The first available record in the **setup.bin** file is read into memory. The process accomplishes the following:
        - Validates the file header record
        - Locates the next available record
        - If the procedure is successful, the current record is invalidated so it cannot be used again
    2. The process places the memory address into the MEBx parameter block
       .
    3. The process calls MEBx.
8. MEBx processes the record.
9. MEBx writes a completion message to the display.
10. The IT technician turns off the computer. The computer is now in the setup state and is ready to be distributed to users in an Enterprise mode environment.
11. Repeat step 5 if you have more than one computer.

Refer to the management console supplier for more information on USB drive key setup and configuration.

USB Drive Key Requirements

The USB drive key must meet the following requirements to be able to set up and configure Intel AMT:

- It must be greater than 16 MB.
- It must be formatted with the FAT16 file system.
- The sector size must be 1 KB.
- The USB drive key is not bootable.
- The **setup.bin** file must be the first file landed on the USB drive key. The USB key must not contain any other files whether hidden, deleted, or otherwise.

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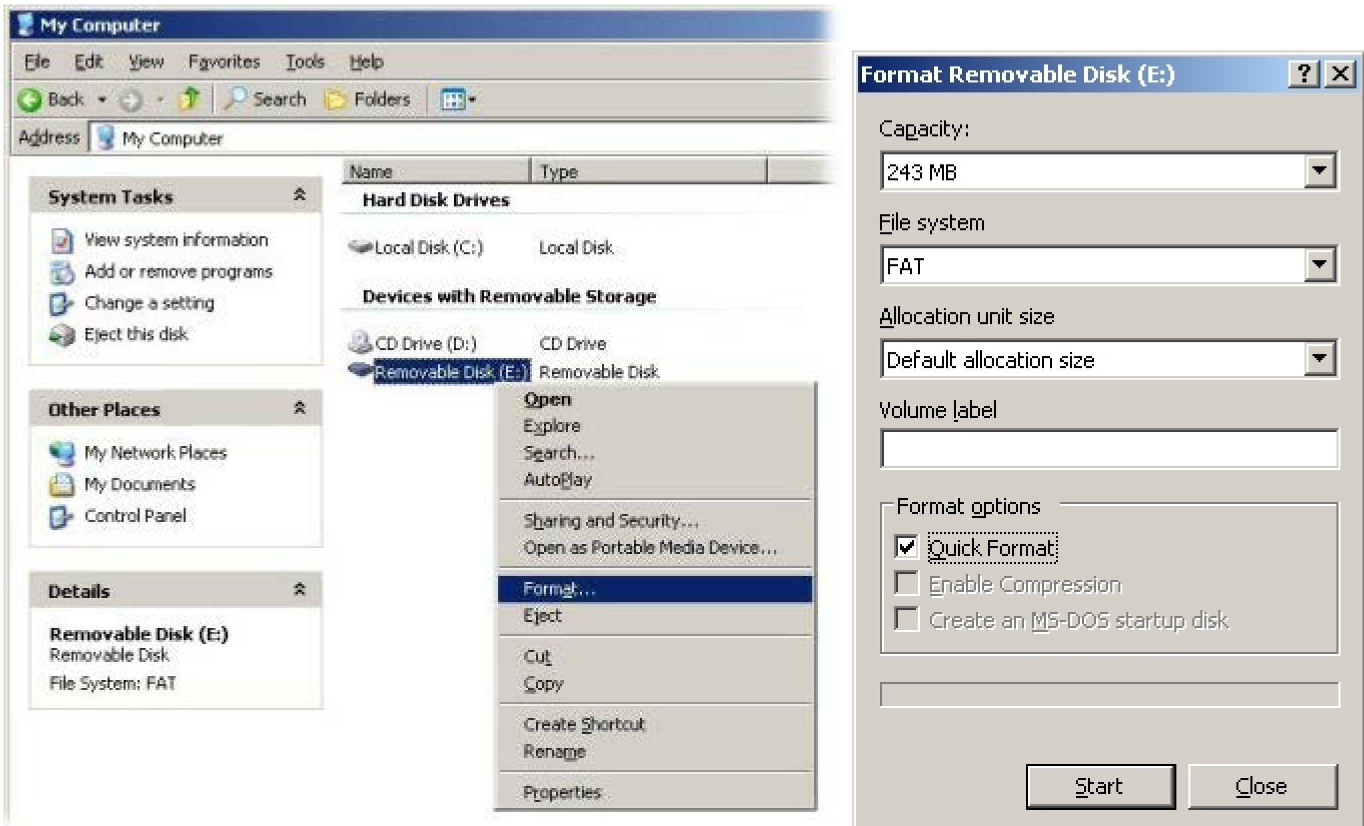
USB Device Procedure

The default console package provided is the Dell!" Client Management (DCM) application. This section provides the procedure to set up and configure Intel® AMT with the DCM package. As mentioned earlier in the document, several other packages are available through third-party vendors.

The computer must be configured and seen by the DNS server before you begin this process. Also, a USB storage device is required and must conform to the requirements listed in Configuration Service--Using a USB Device.

The nature of management software is that it is not always dynamic or real time. In fact, sometimes if you tell a computer to do something, such as to reboot, you may just have to do it again before it will work.

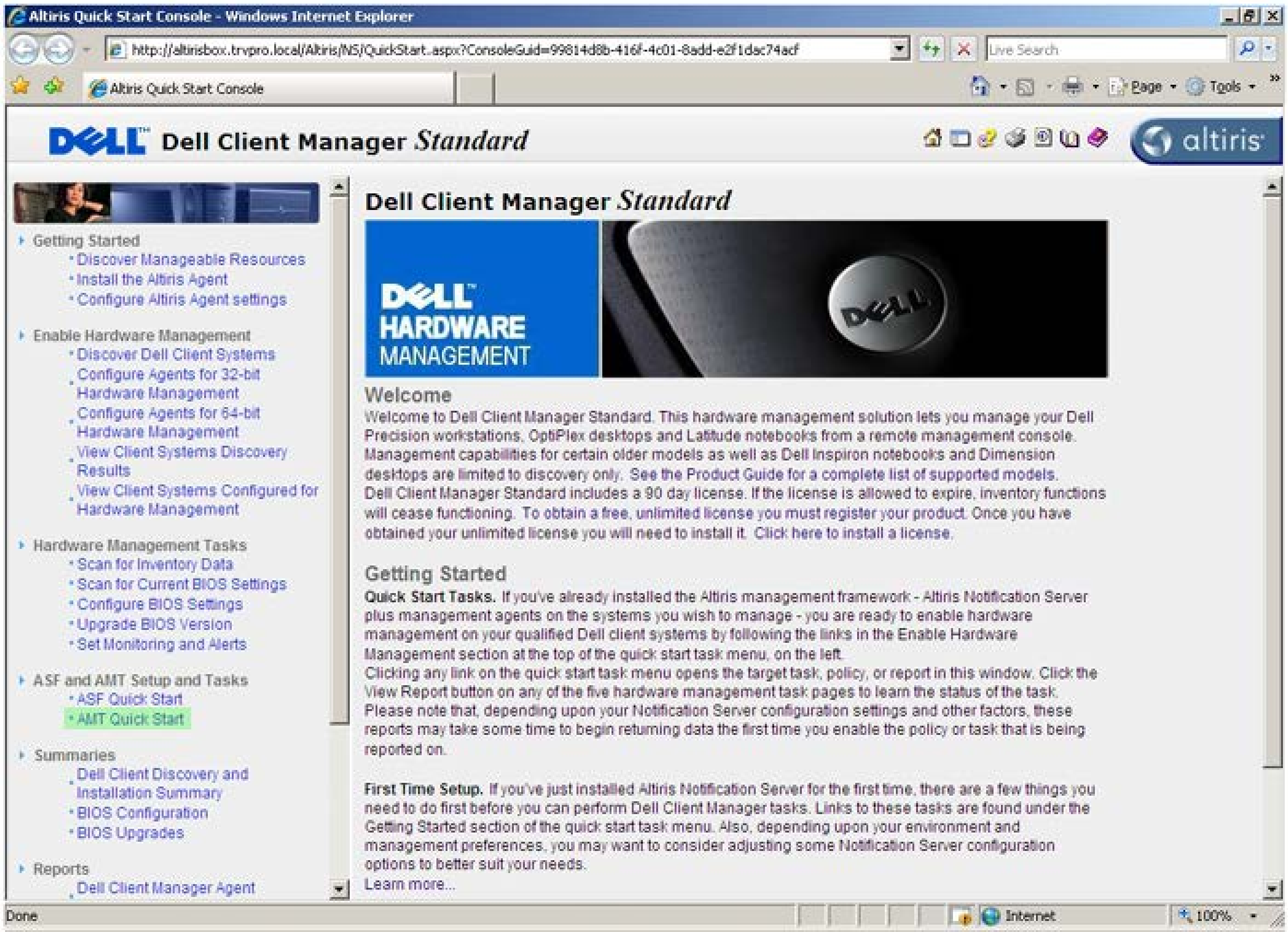
1. Format a USB device with the FAT16 file system and no volume label and then set it aside.



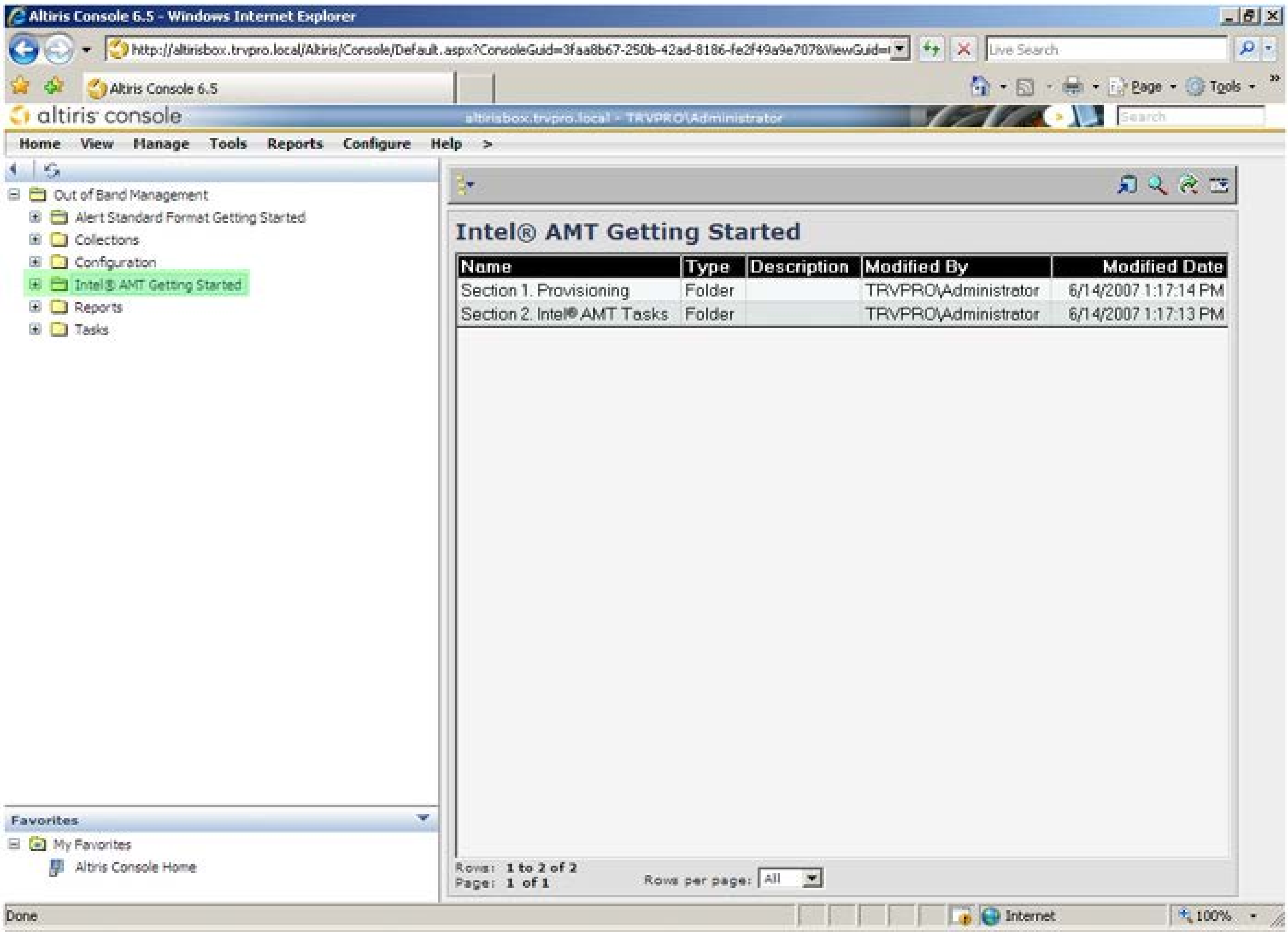
2. Open the Altiris® Dell Client Manager application by double clicking the desktop icon or through the Start menu.



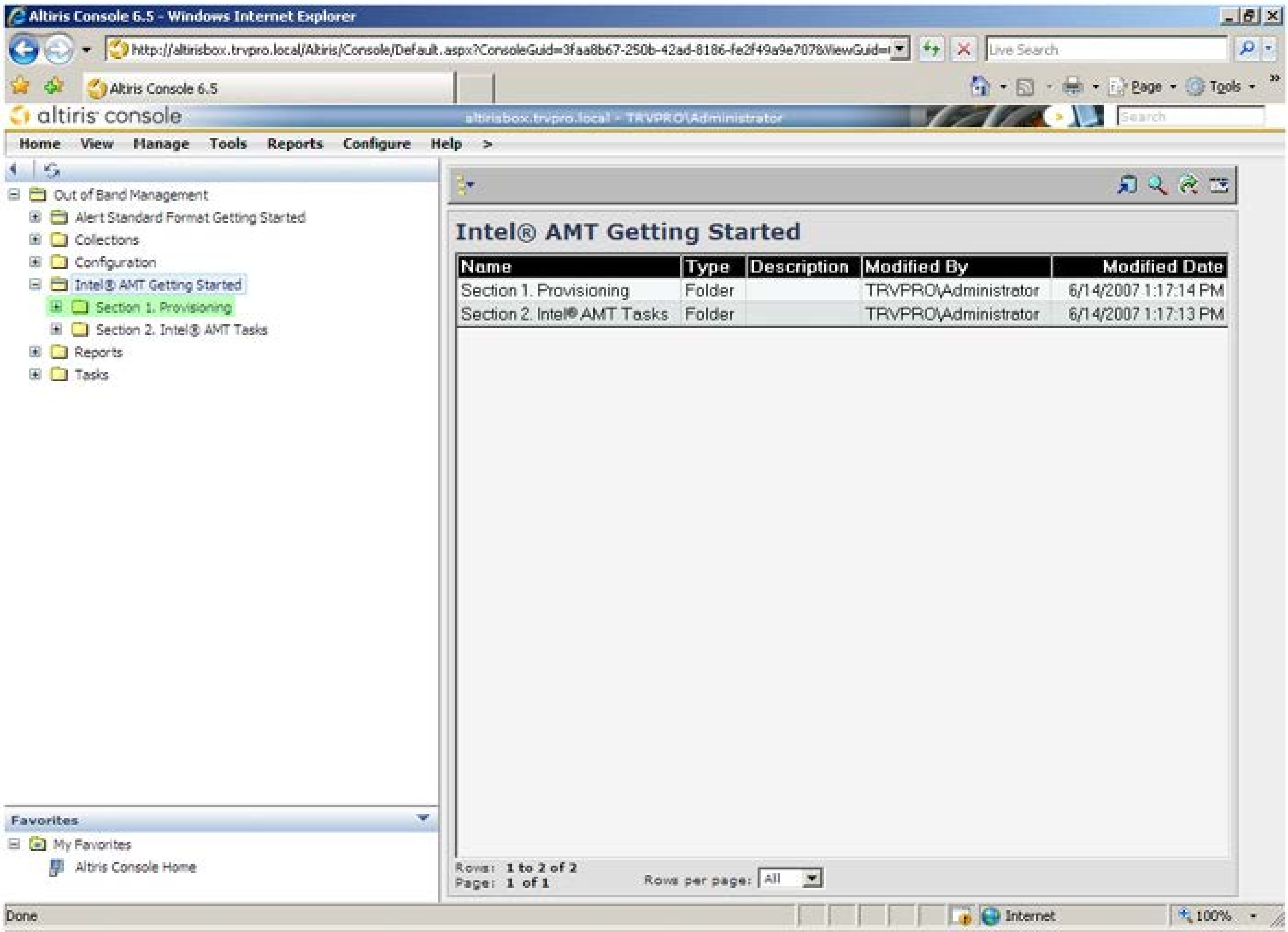
3. Select **AMT Quick Start** from the left navigation menu to open the Altiris Console.



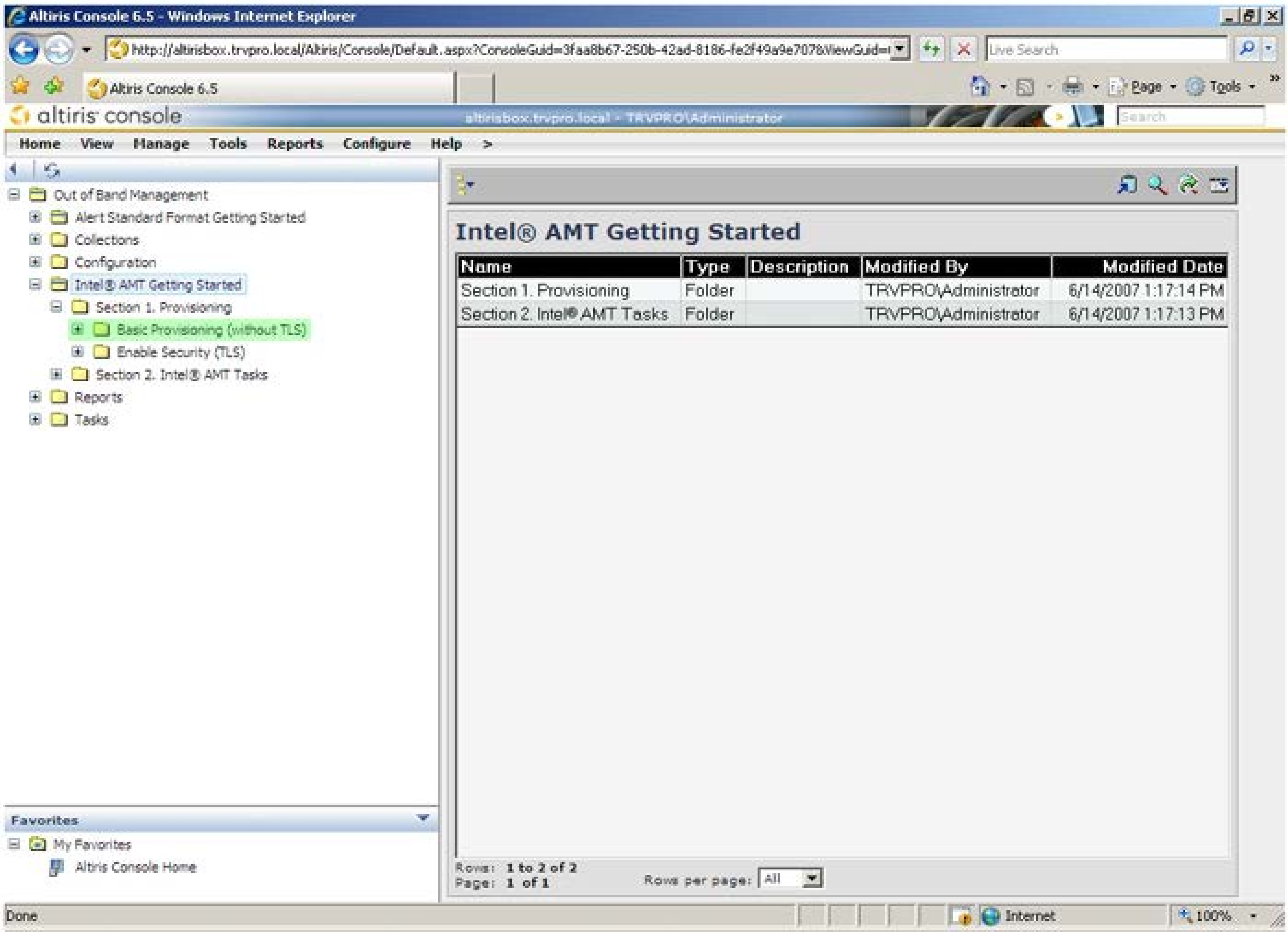
4. Click the <+> to expand the **Intel AMT Getting Started** section.



5. Click the <+> to expand the **Section 1. Provisioning** section.

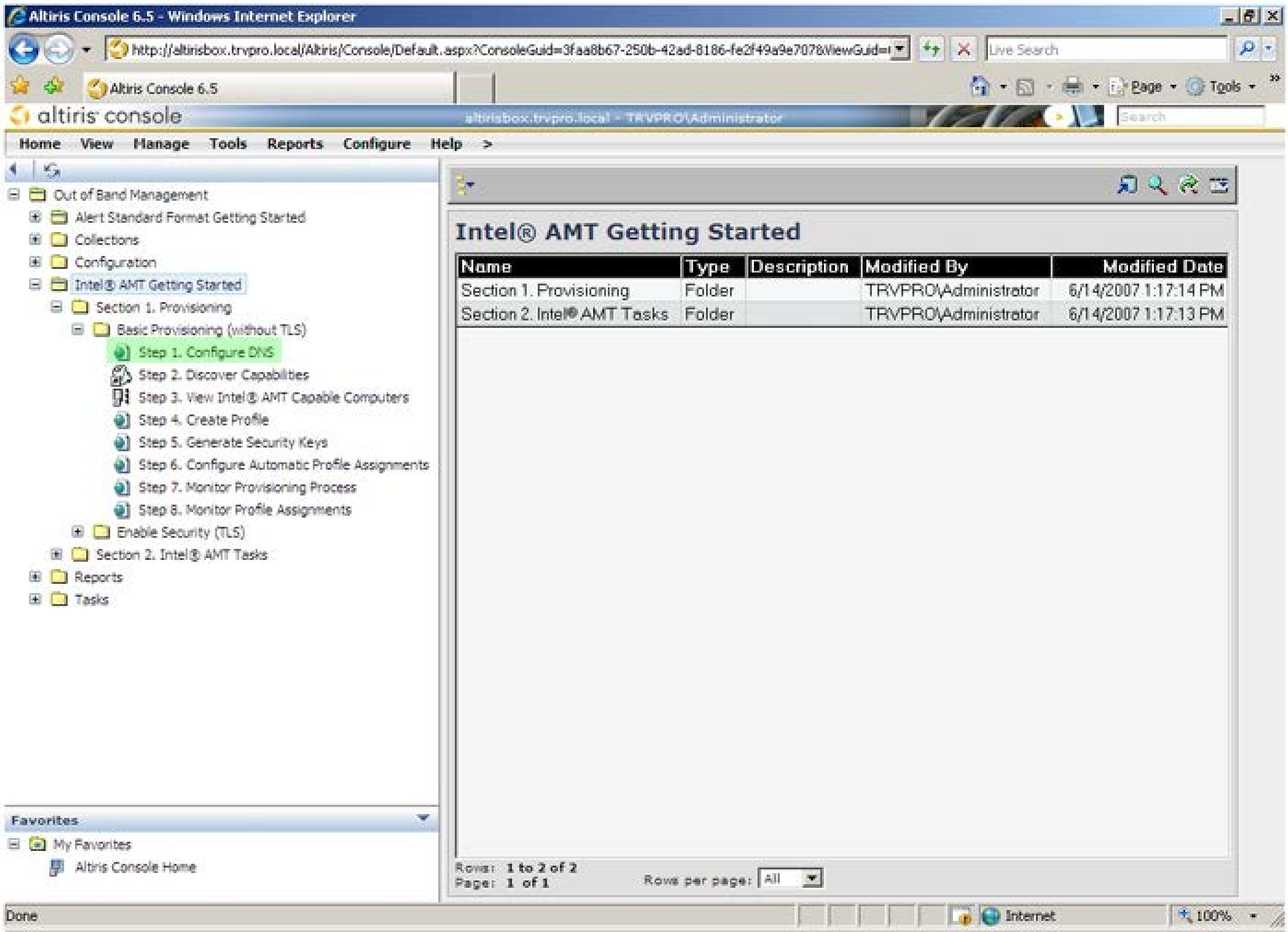


6. Click the <+> to expand the **Basic Provisioning (without TLS)** section.

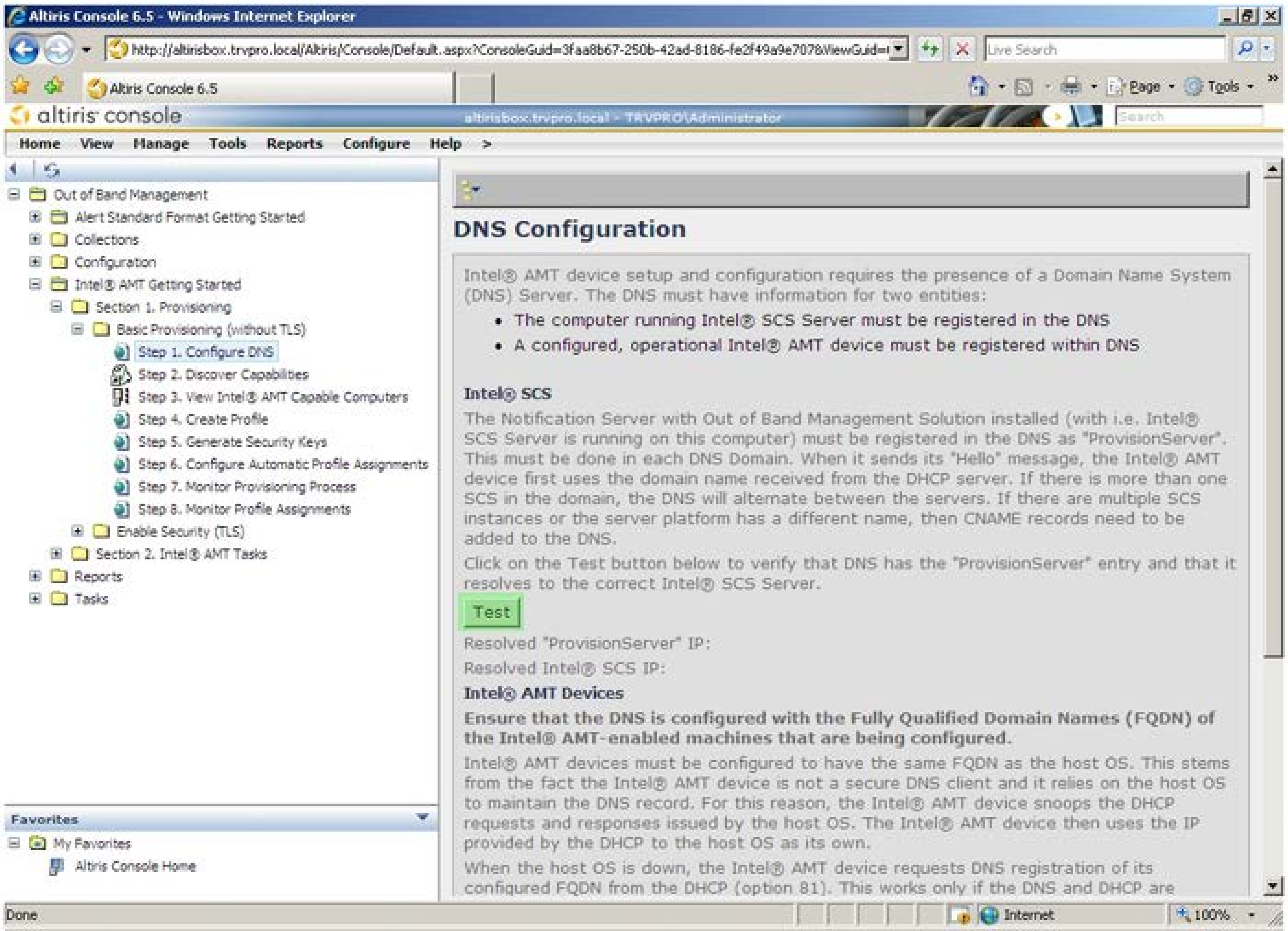


7. Select **Step 1. Configure DNS**.

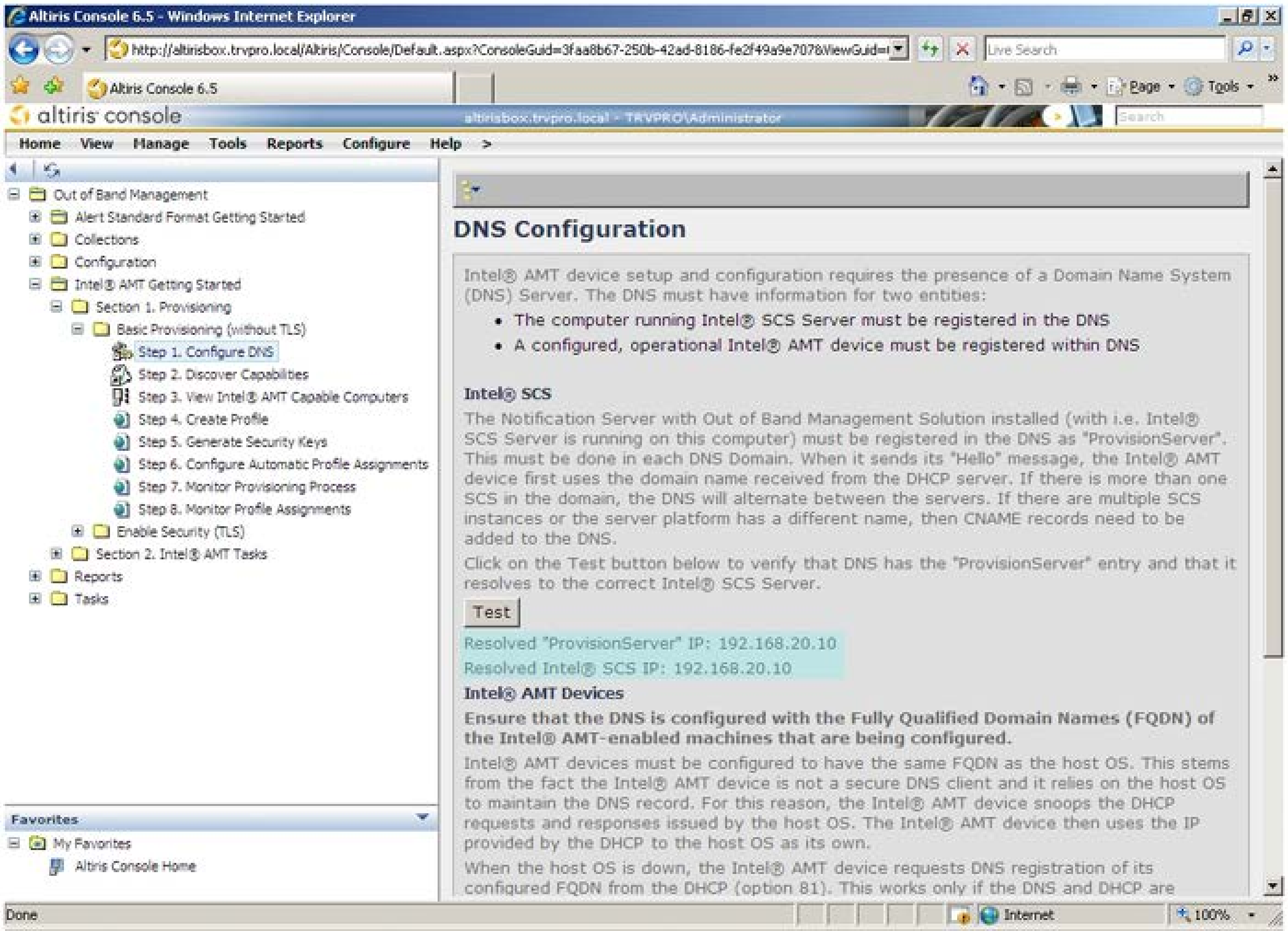
   The notification server with an out-of-band management solution installed must be registered in DNS as "ProvisionServer."



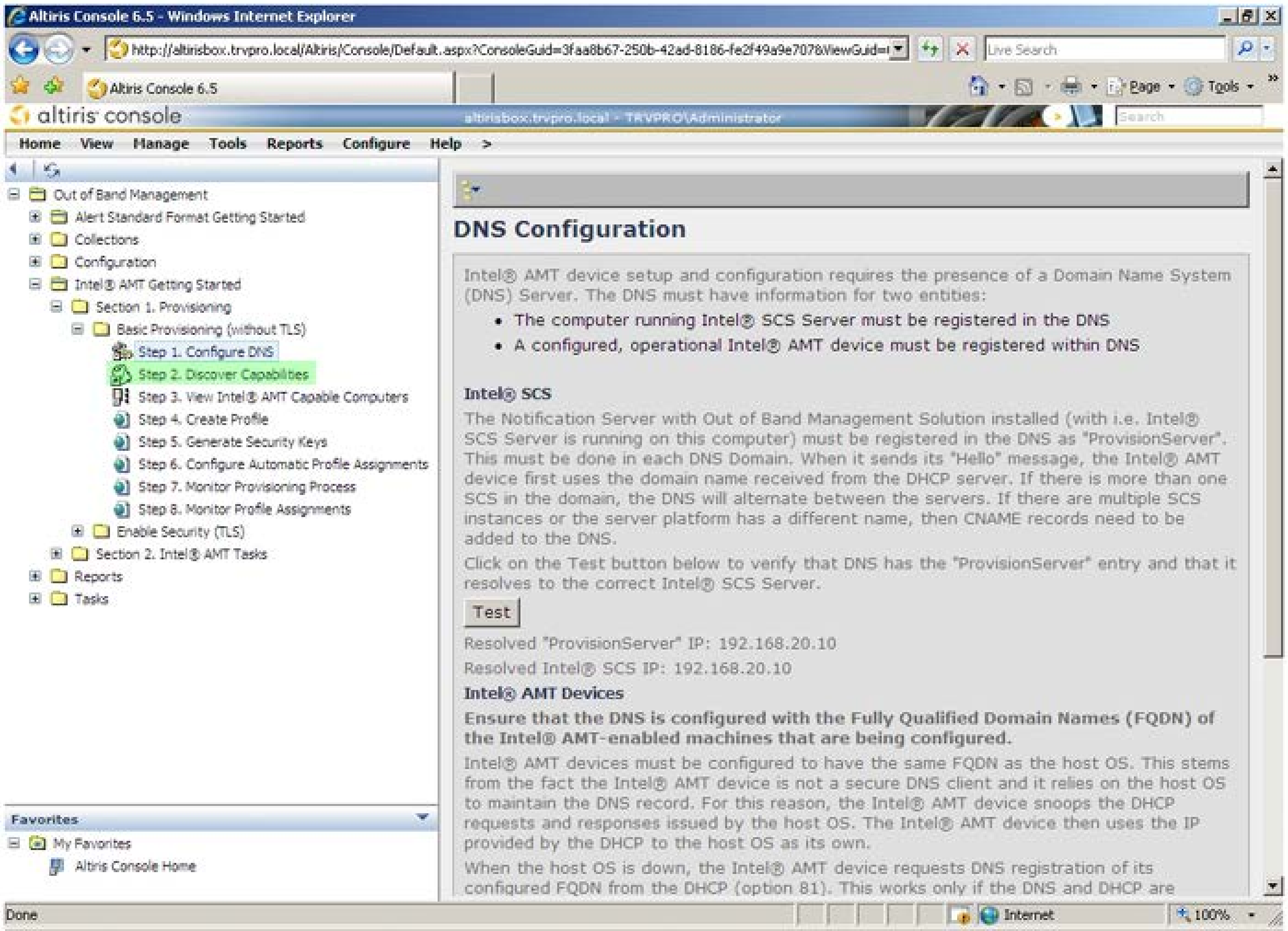
8. Click **Test** on the **DNS Configuration** screen to verify that DNS has the ProvisionServer entry and that it resolves to the correct Intel setup and configuration server (SCS).



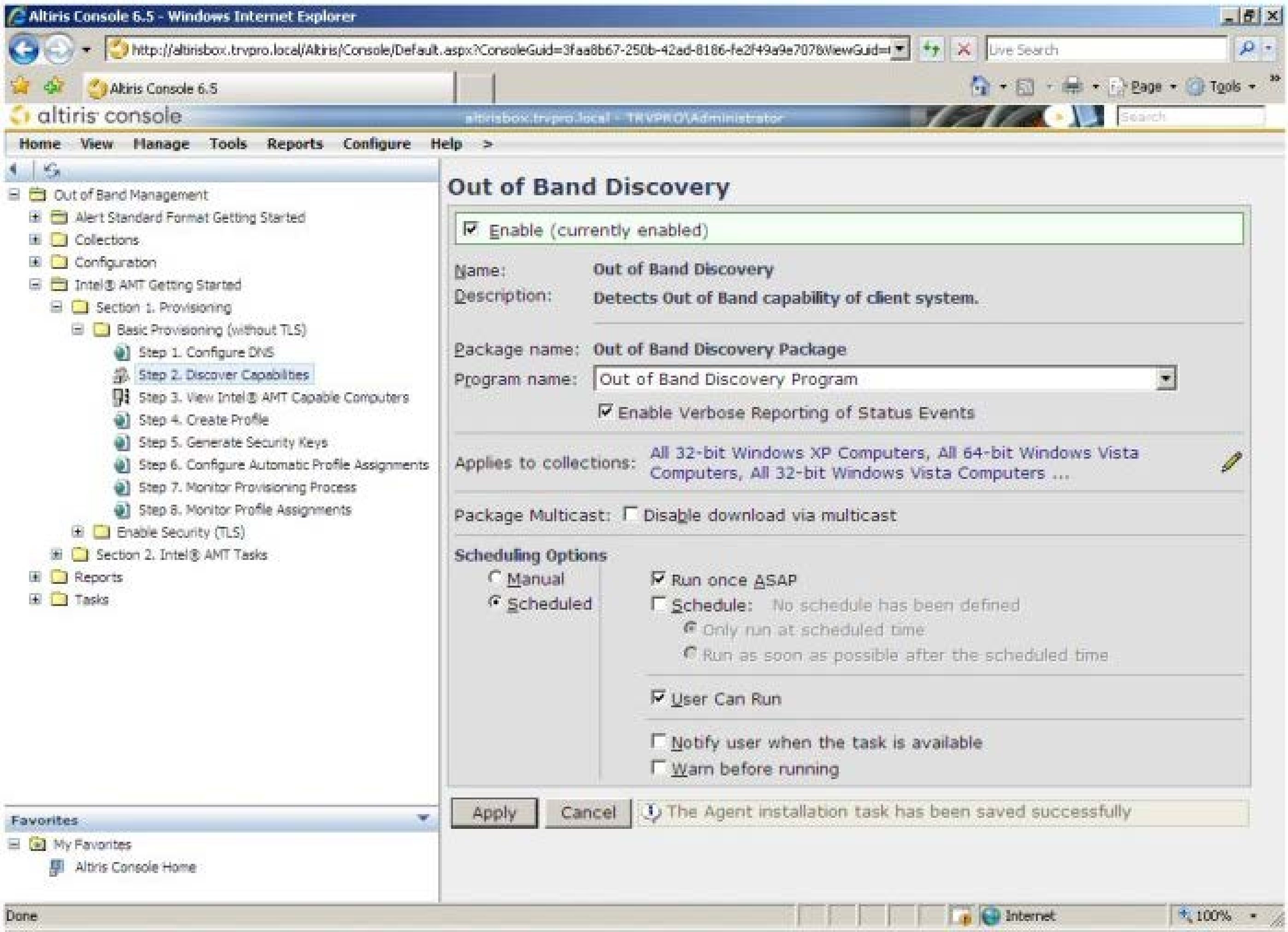
The IP address for the ProvisionServer and Intel SCS are now visible.



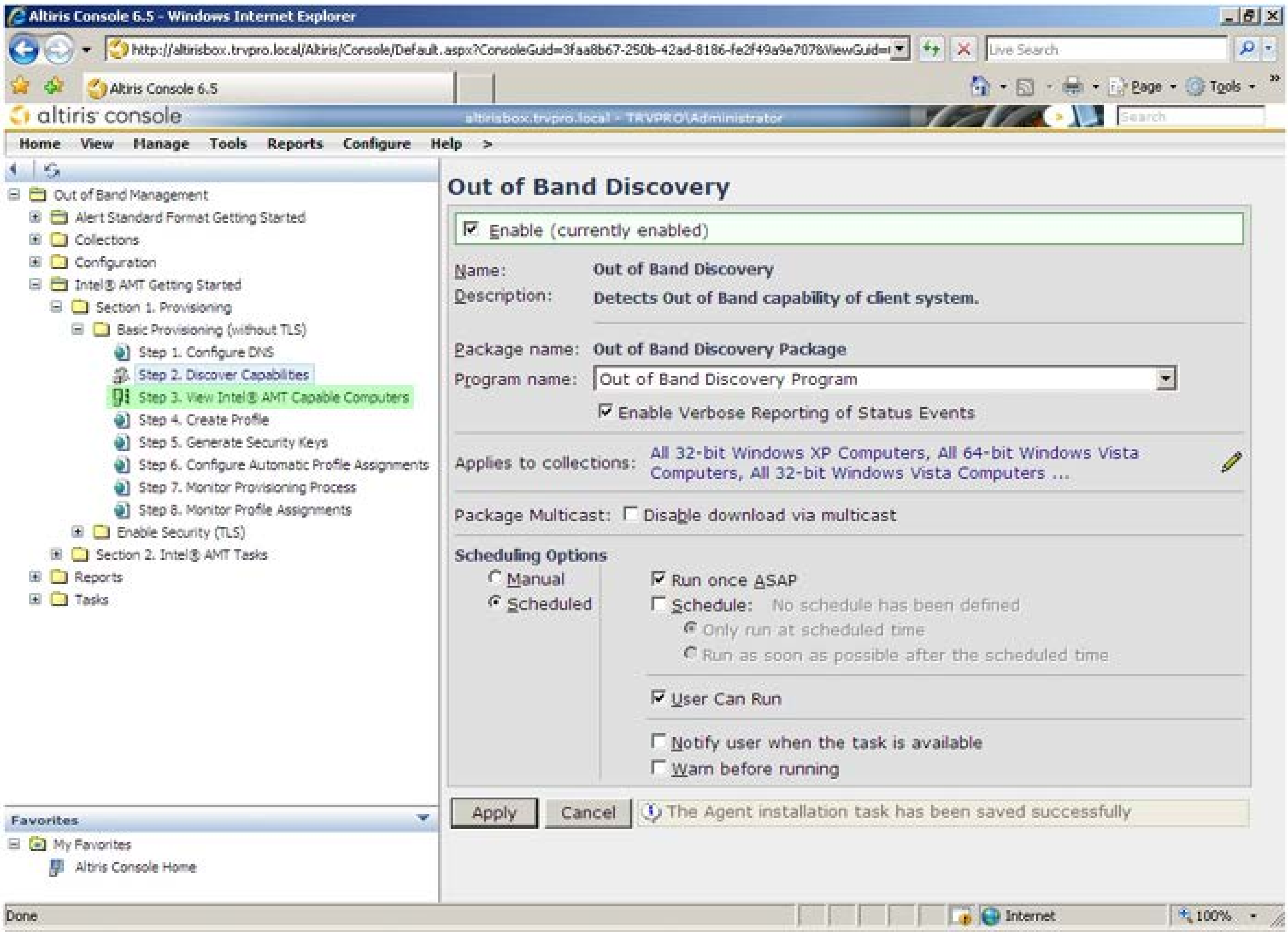
9. Select **Step 2. Discovery Capabilities**.



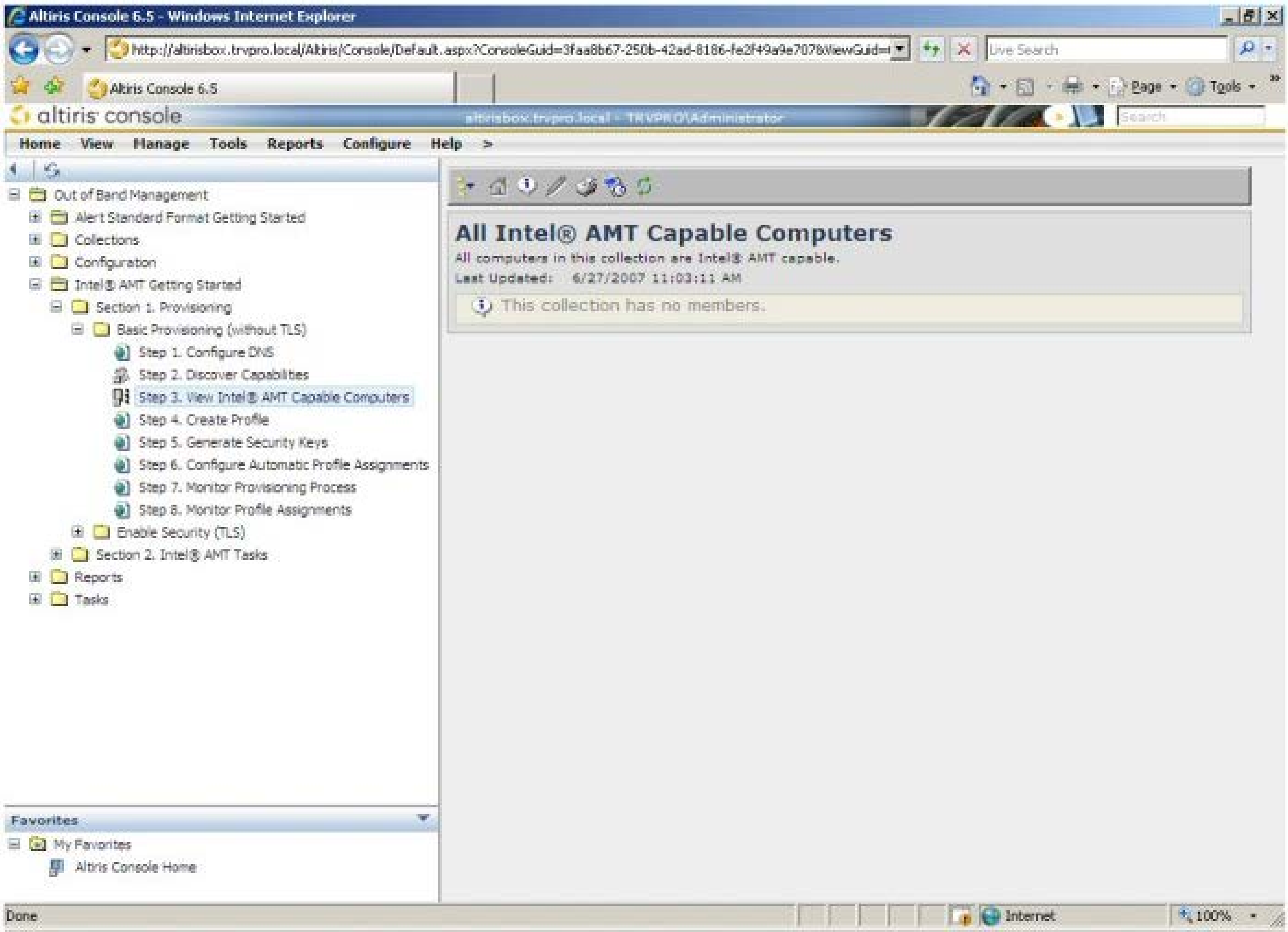
10. Verify that the setting is **Enabled**. If **Disabled**, click the check box next to **Disabled** and click **Apply**.



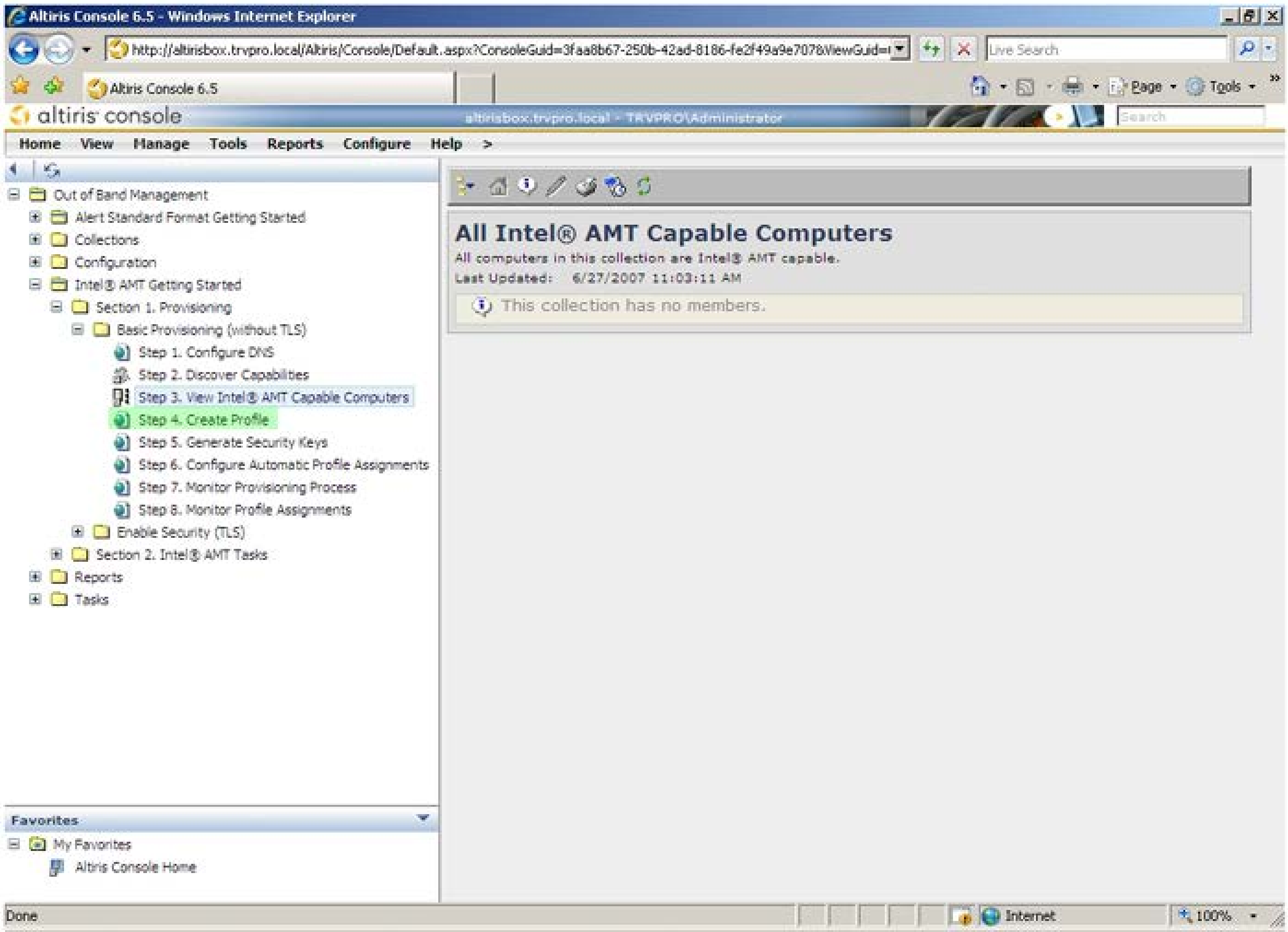
11. Select **Step 3. View Intel AMT Capable Computers**.



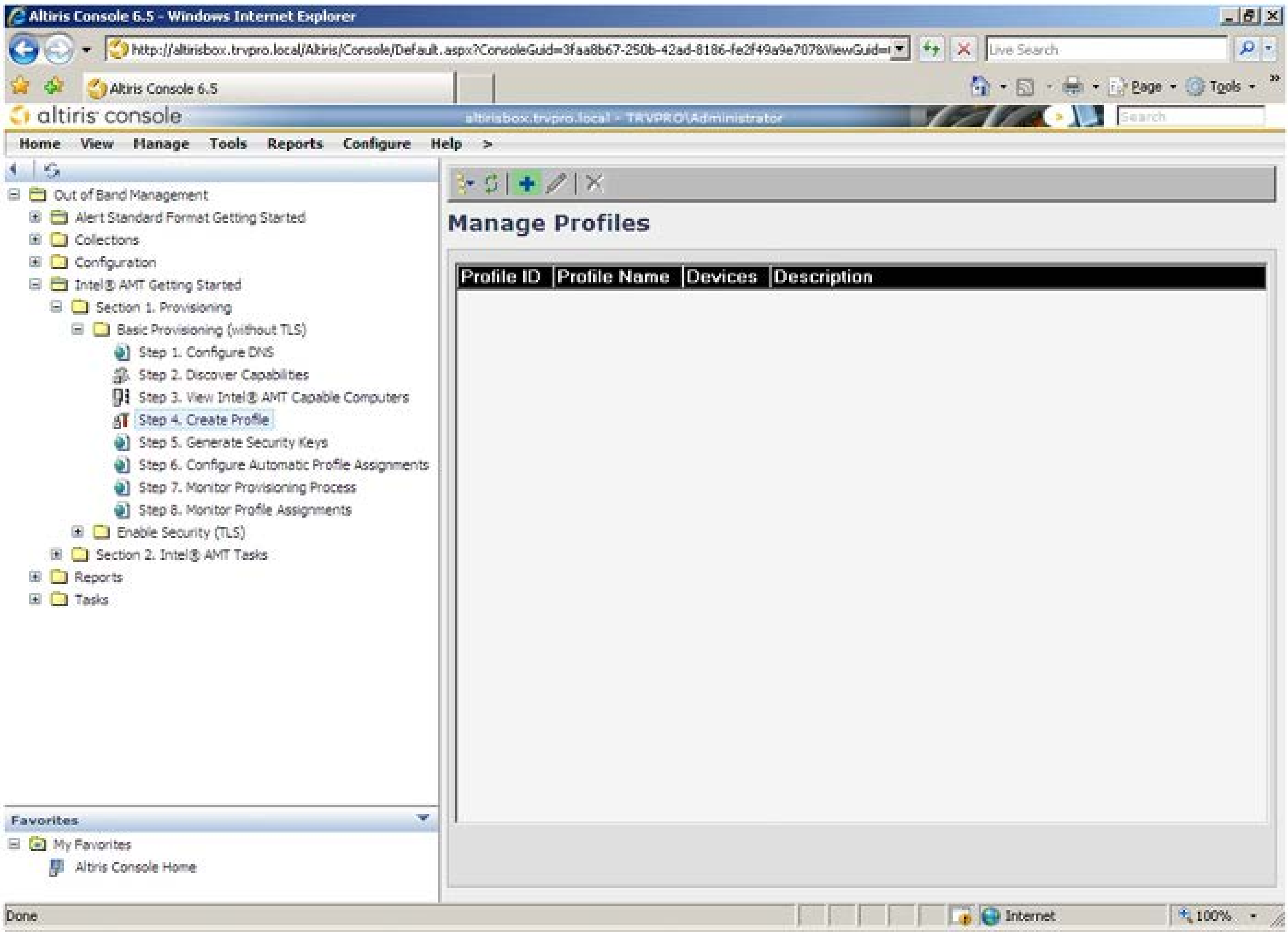
Any Intel AMT capable computers on the network are visible in this list.



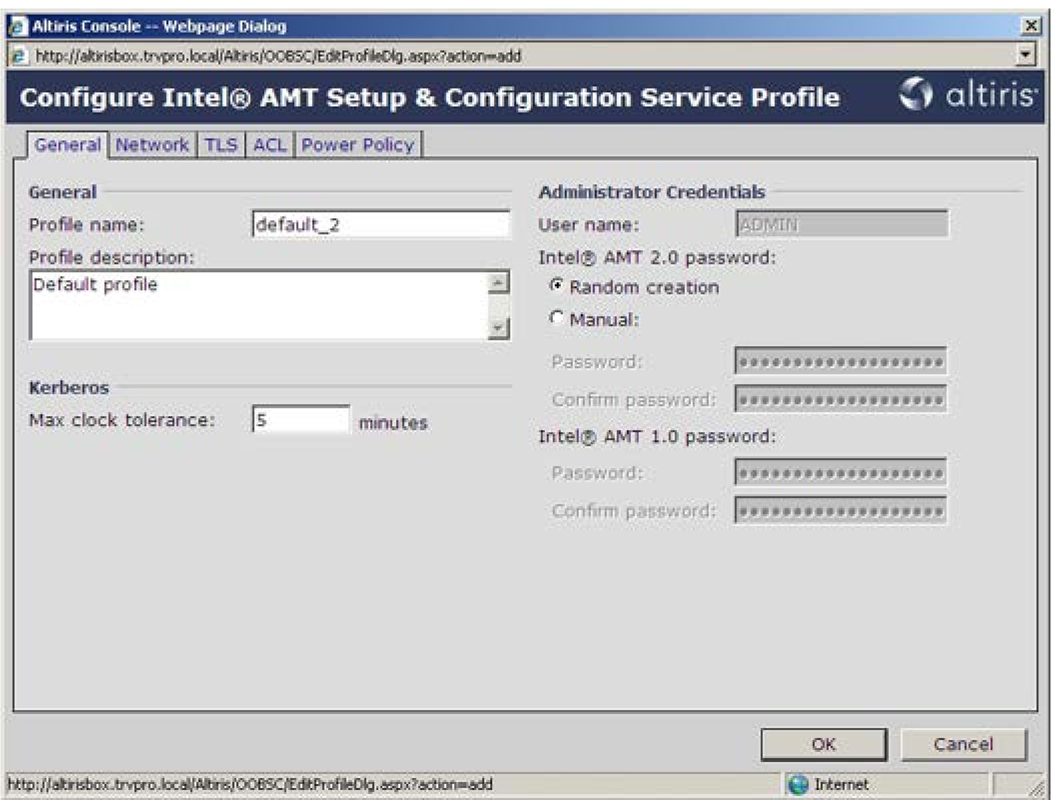
12. Select **Step 4. Create Profile**.



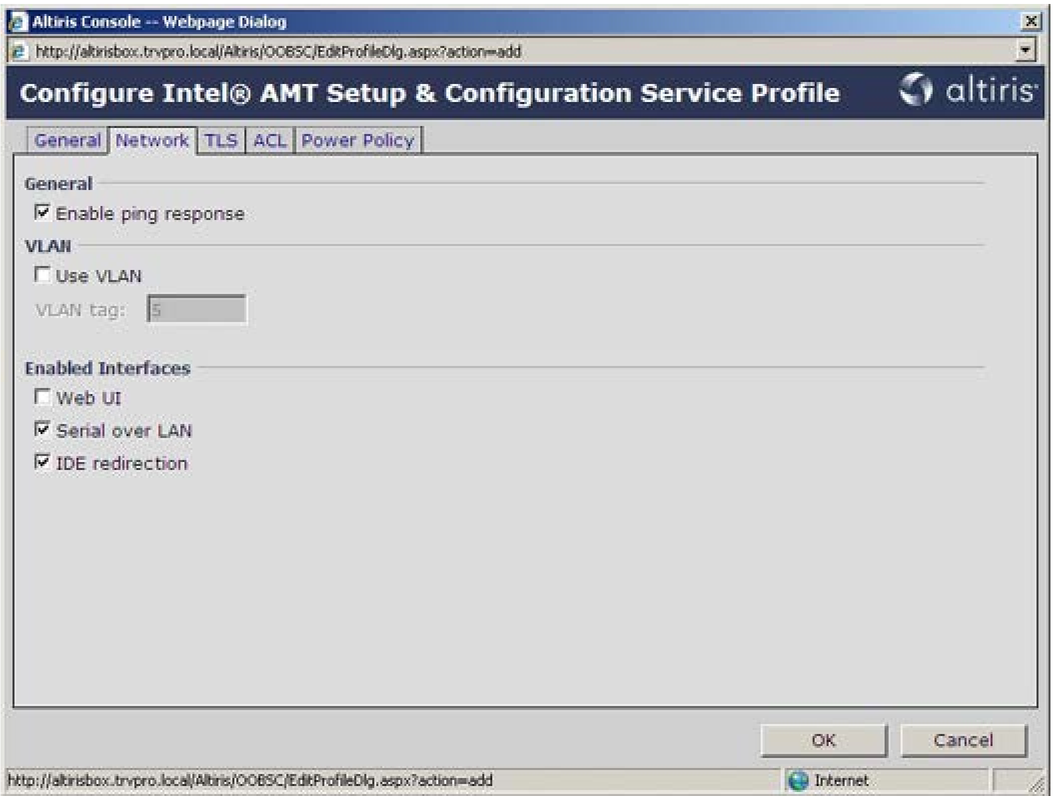
13. Click the plus symbol to add a new profile.



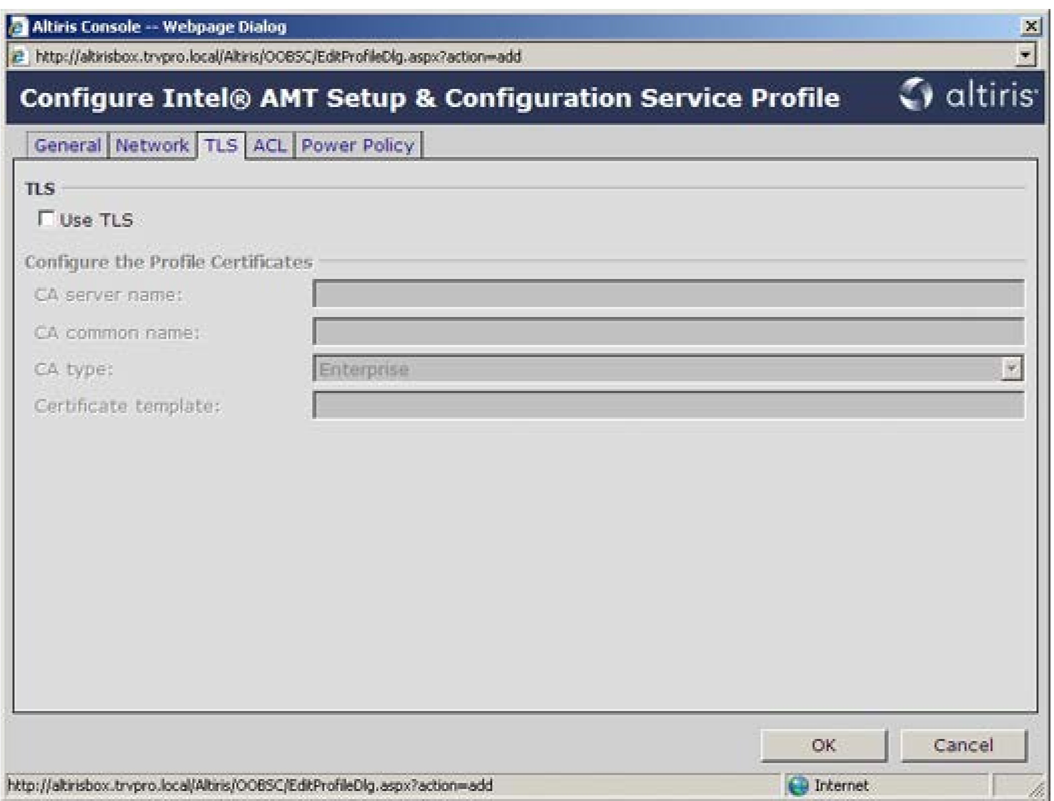
On the **General** tab the administrator can modify the profile name and description along with the password. The administrator sets a standard password for easy maintenance in the future. Select the **manual** radio button and enter a new password.



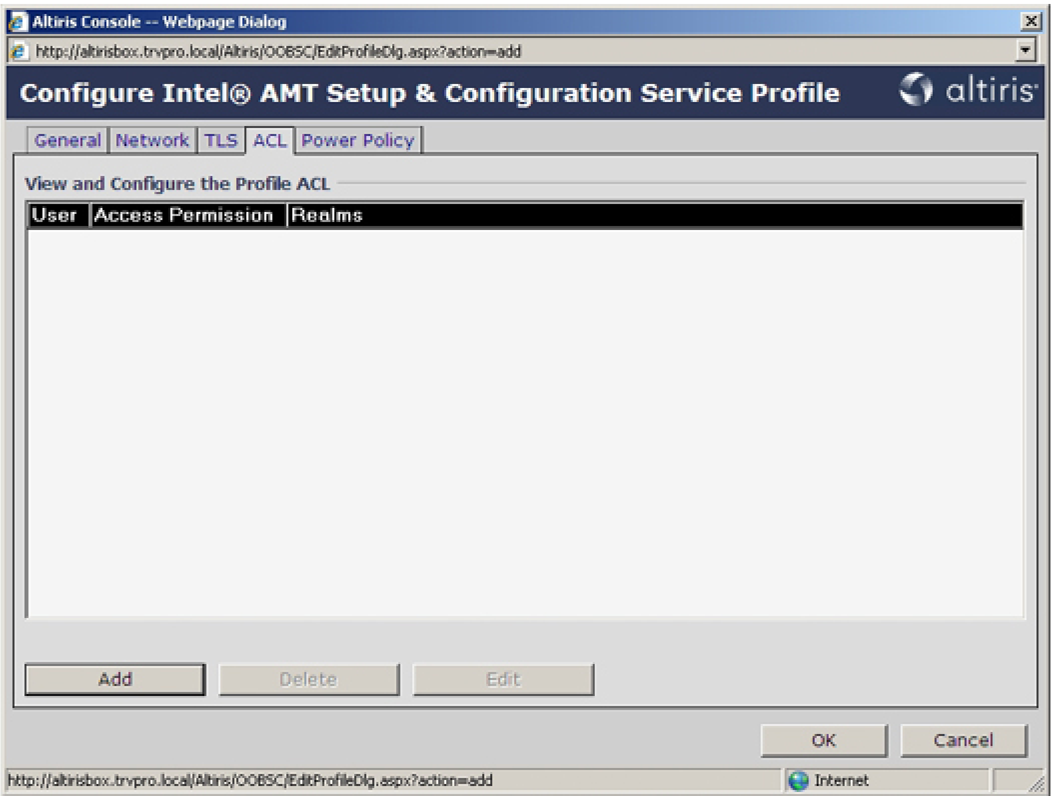
The **Network** tab provides the option to enable ping responses, VLAN, WebUI, Serial over LAN, and IDE Redirection. If you are configuring Intel AMT manually, all these settings are also available in the MEBx.



The **TLS** (Transport Layer Security) tab provides the ability to enable TLS. If enabled, several other pieces of information are required including the certificate authority (CA) server name, CA common name, CA type, and certificate template.

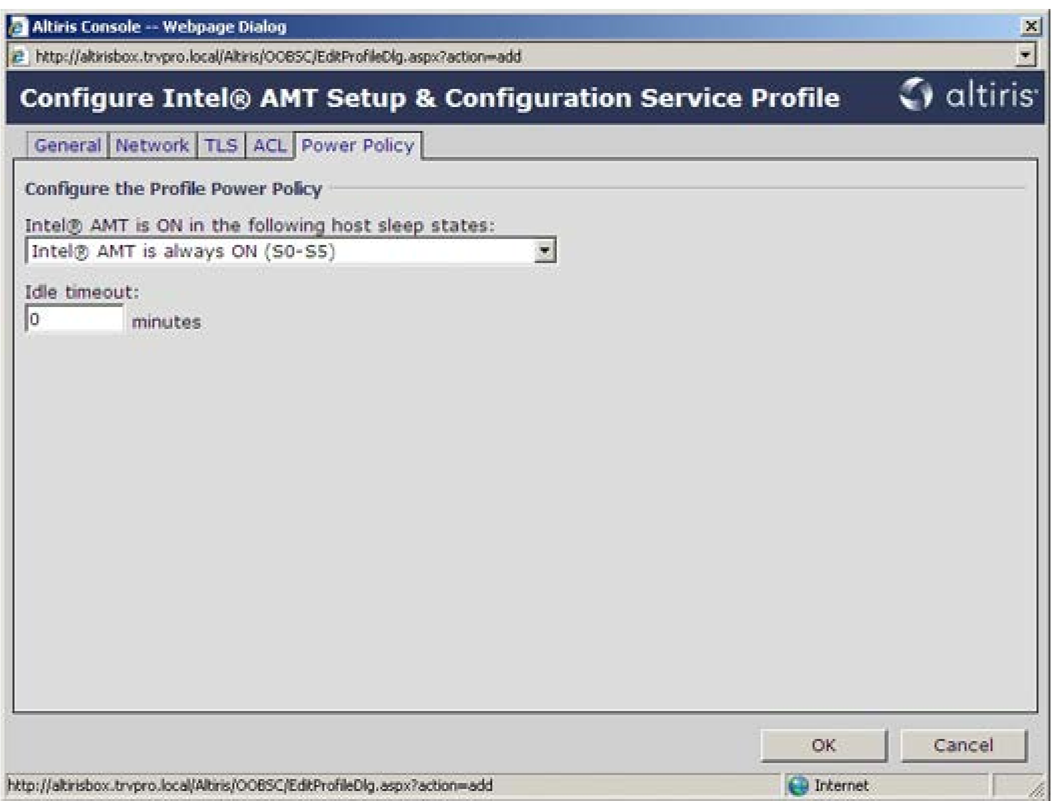


The **ACL** (access control list) tab is used to review users already associated with this profile and to add new users and define their access privileges.

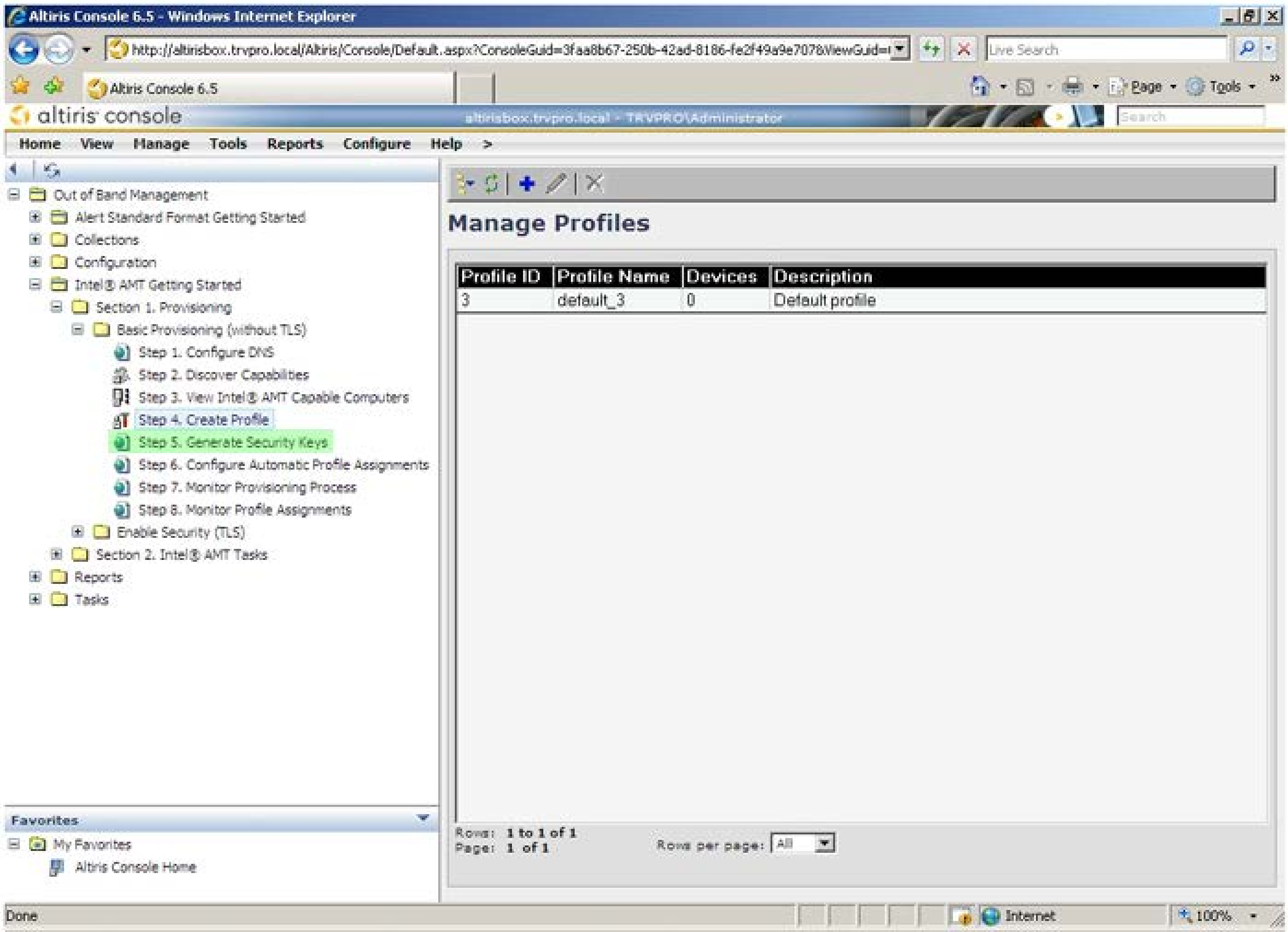


The **Power Policy** tab has configuration options to select the sleep states for Intel AMT as well as an **Idle Timeout** setting. It is recommended that Idle timeout is always set to 0 for optimal performance.

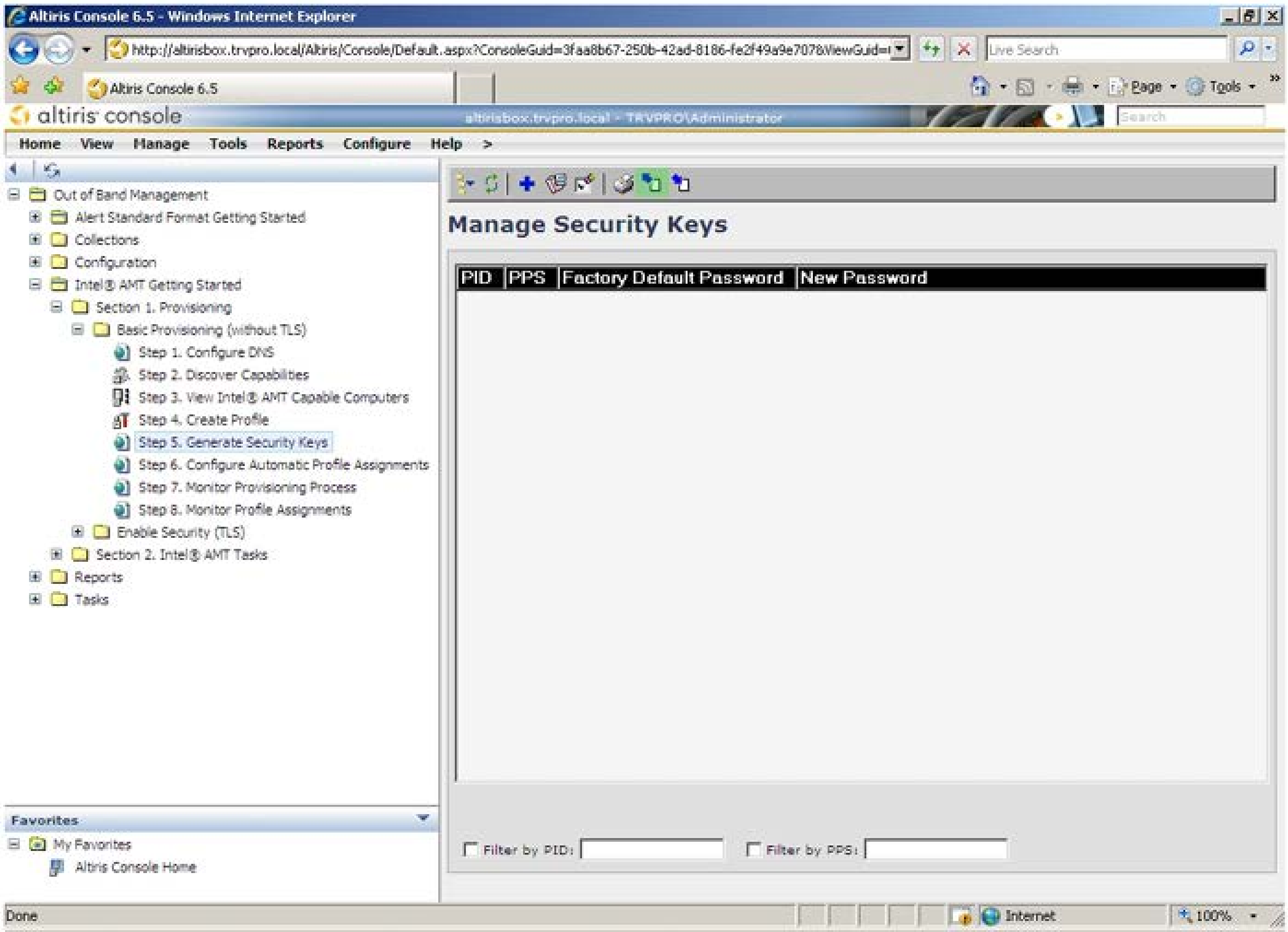
The setting for the **Power Policy** tab can potentially impact a computer's ability to remain E-Star 4.0 compliant.



14. Select **Step 5. Generate Security Keys**.



15. Select the icon with the arrow pointing out to **Export Security Keys to USB Key**.



16. Select the **Generate keys before export** radio button.



17. Enter the number of keys to generate (depends on the number of computers that need to be provisioned). The default is 50.



18. The Intel ME default password is **admin**. Configure the new Intel ME password for the environment.



19. Click **Generate**. Once the keys have been created, a link appears to the left of the **Generate** button.



20. Insert the previously formatted USB device into a USB connector on the Provisioning Serverr.
21. Click the **Download USB key file** link to download **setup.bin** file to the USB device. The USB device is recognized by default; save the file to the USB device.

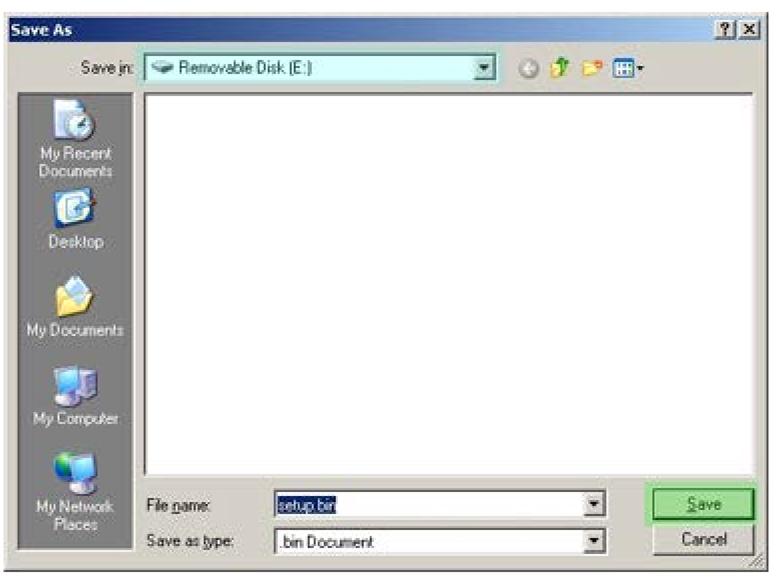
    If additional keys are needed in the future, the USB device must be reformatted before saving the **setup.bin** file to it.



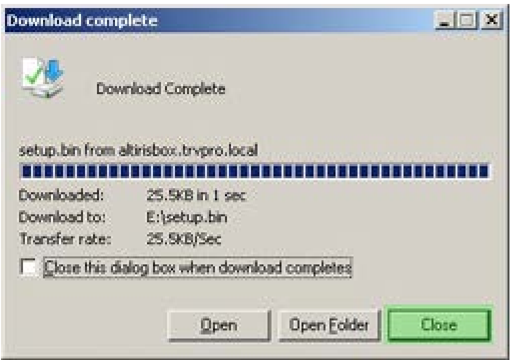
a. Click **Save** in the **File Download** dialog box.



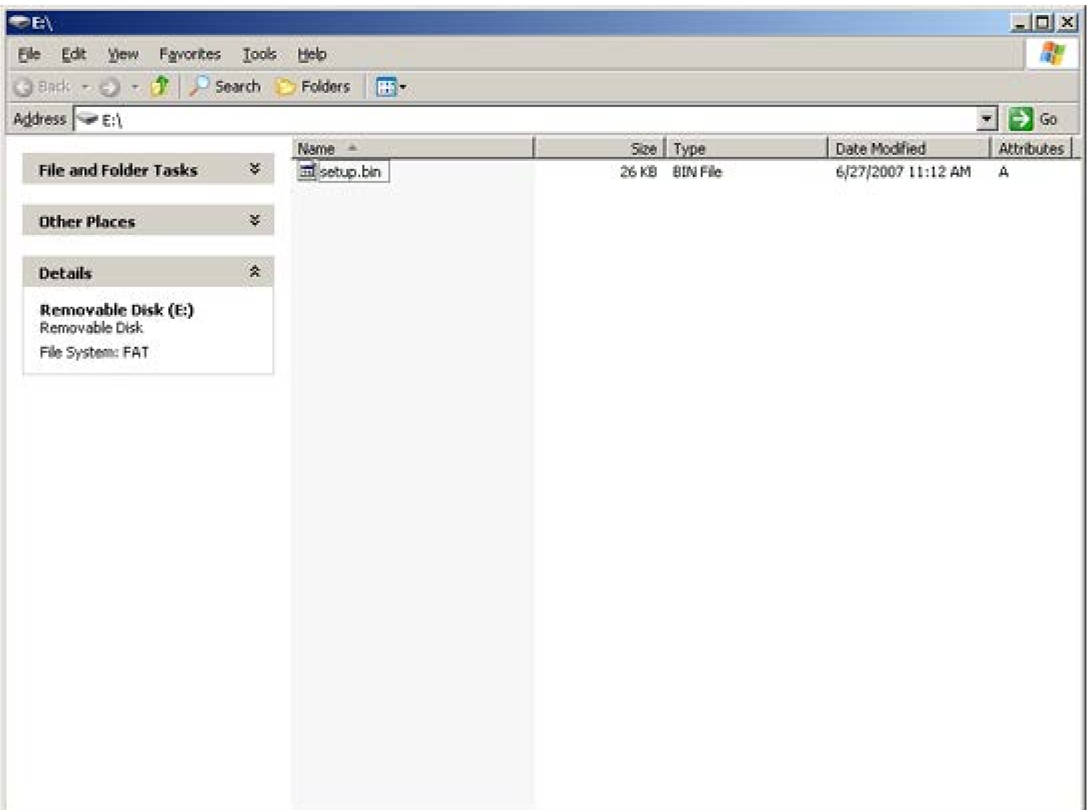
b. Verify the **Save in:** location is directed to the USB device. Click **Save**.



c. Click **Close** in the **Download complete** dialog box.



The **setup.bin** file is now visible in the drive Explorer window.



22. Close the **Export Security Keys to USB Key** and drive explorer windows to return to the Altiris Console.

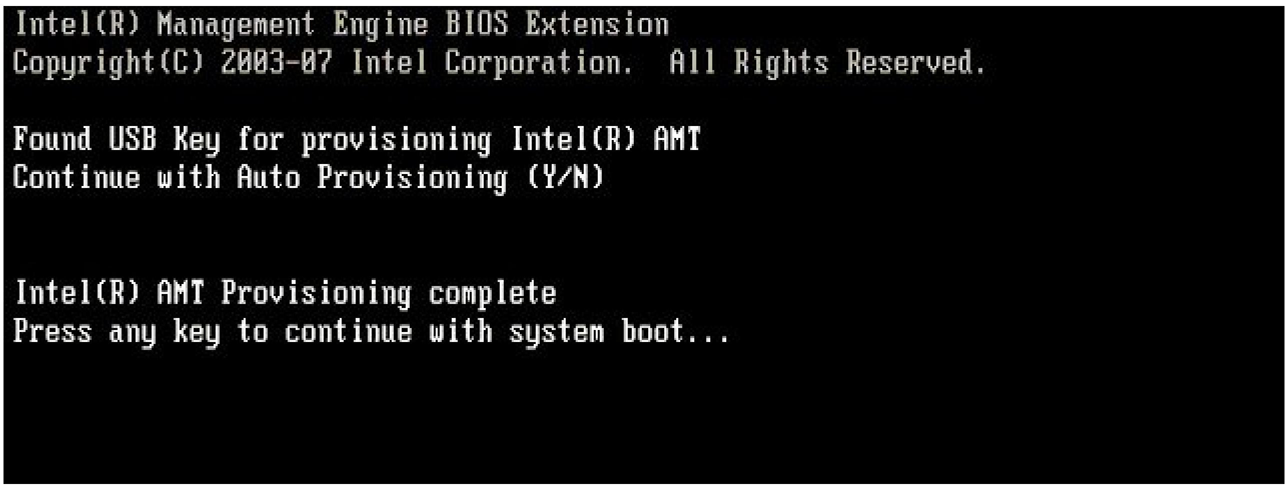
23. Take the USB device to the computer, insert the device, and turn on the computer. The USB device is recognized immediately and you are prompted to

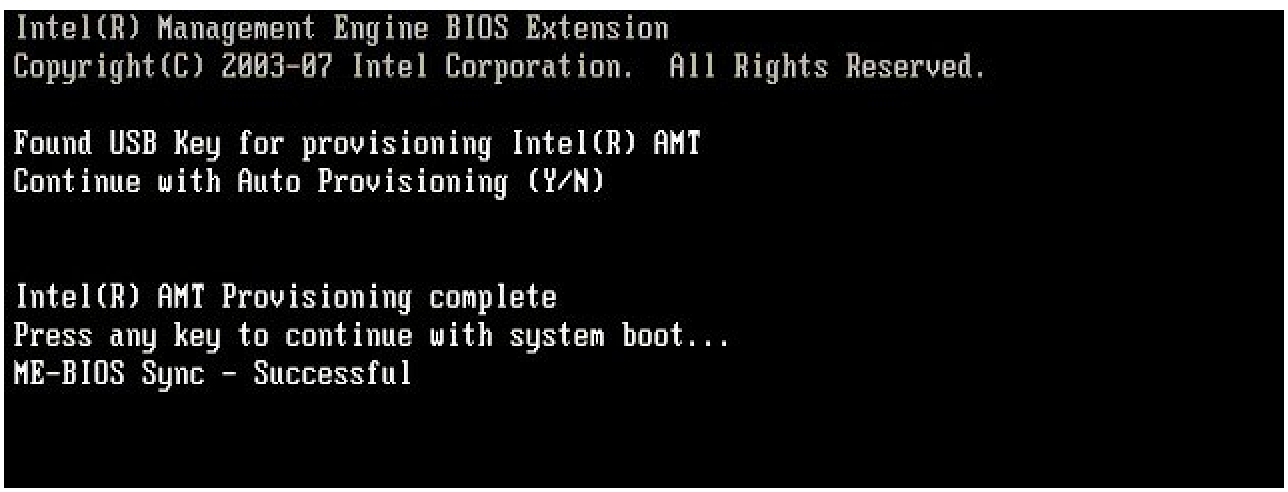
    `Continue with Auto Provisioning (Y/N)`

    Press <y>.

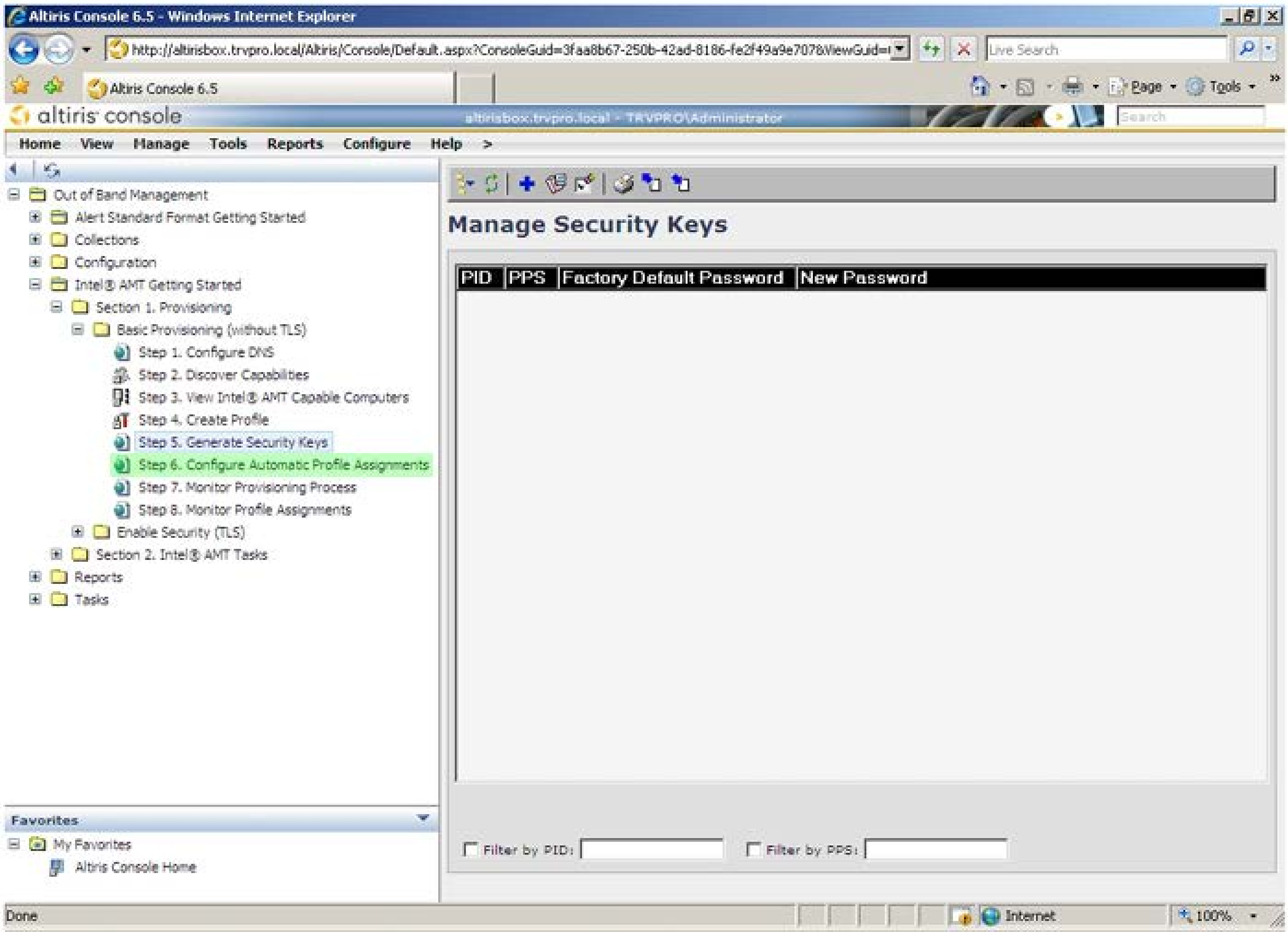


Press any key to continue with system boot...

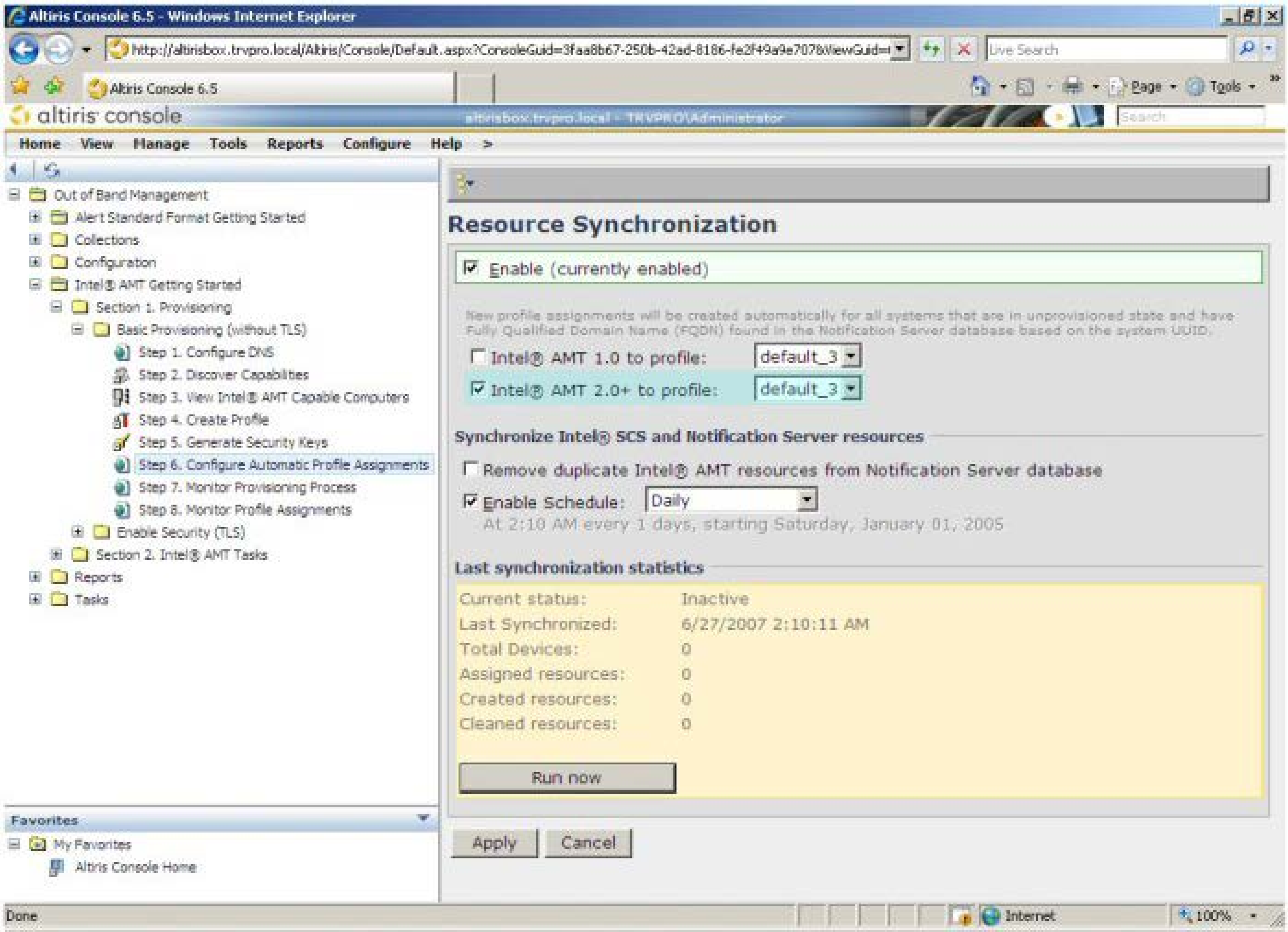




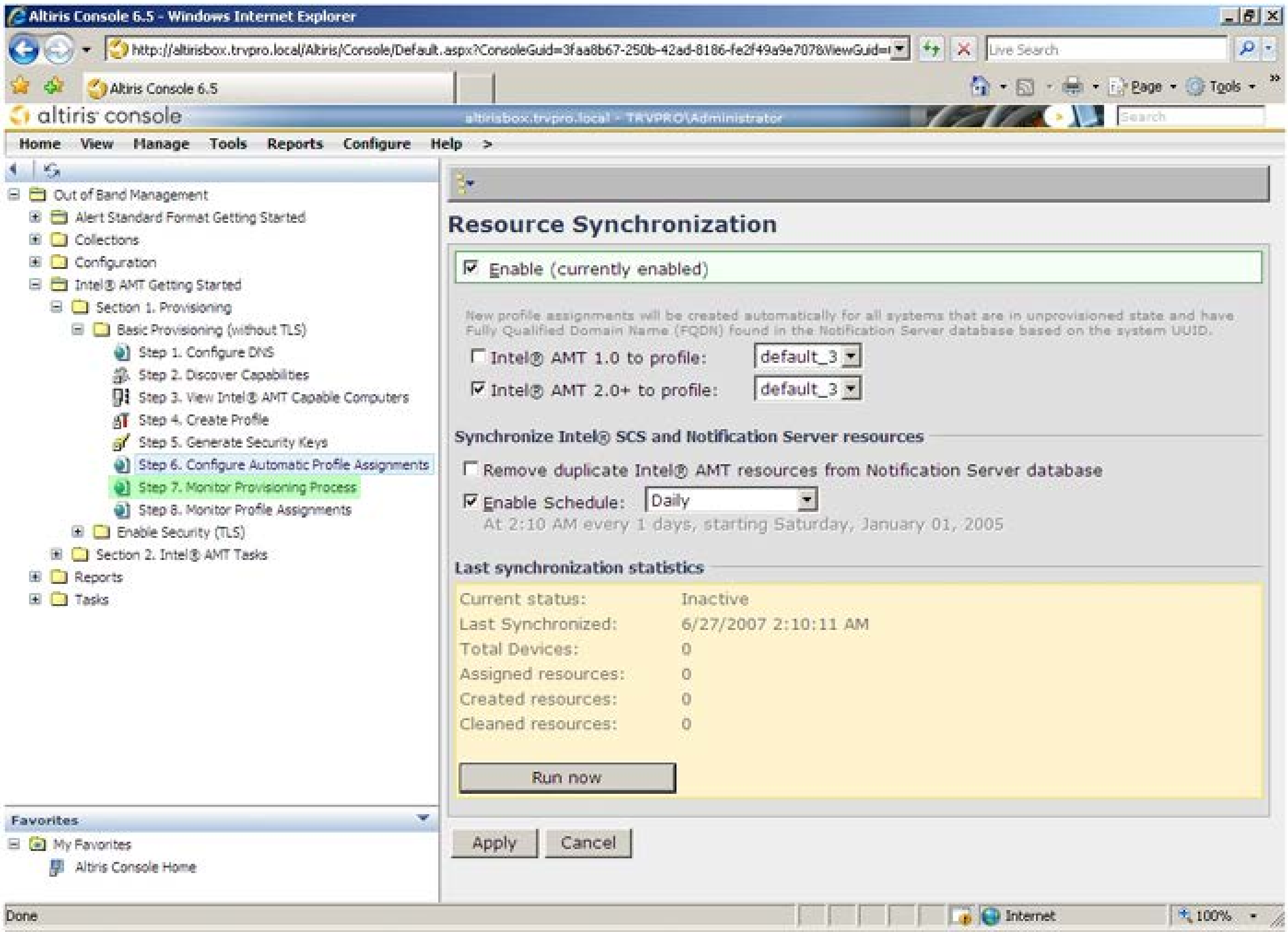
24. Once complete, turn off the computer and move back to the management server.
25. Select **Step 6. Configure Automatic Profile Assignments**.



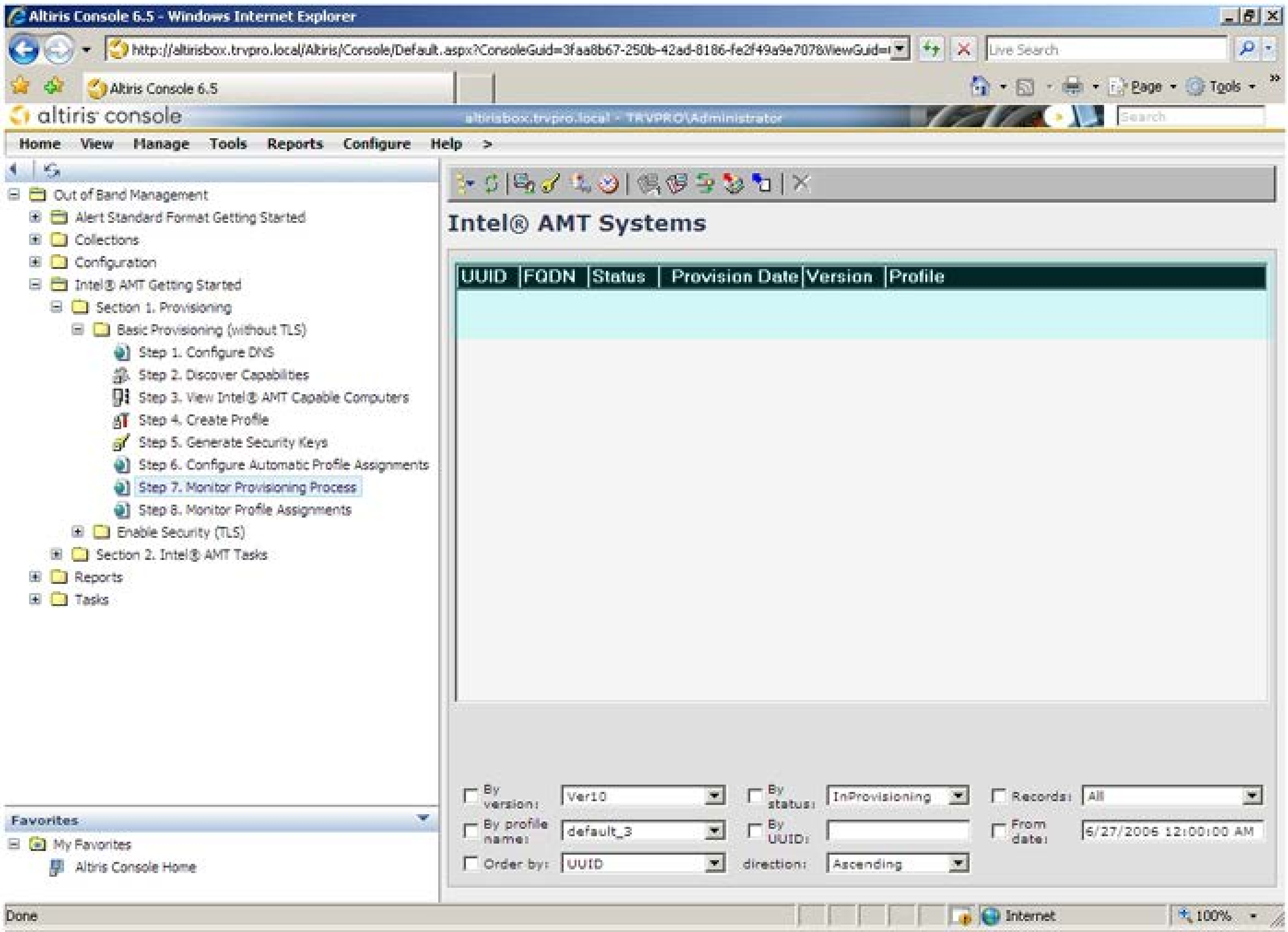
26. Verify that the setting is enabled. In the **Intel AMT 2.0+** dropdown, select the profile created previously. Configure the other settings for the environment.



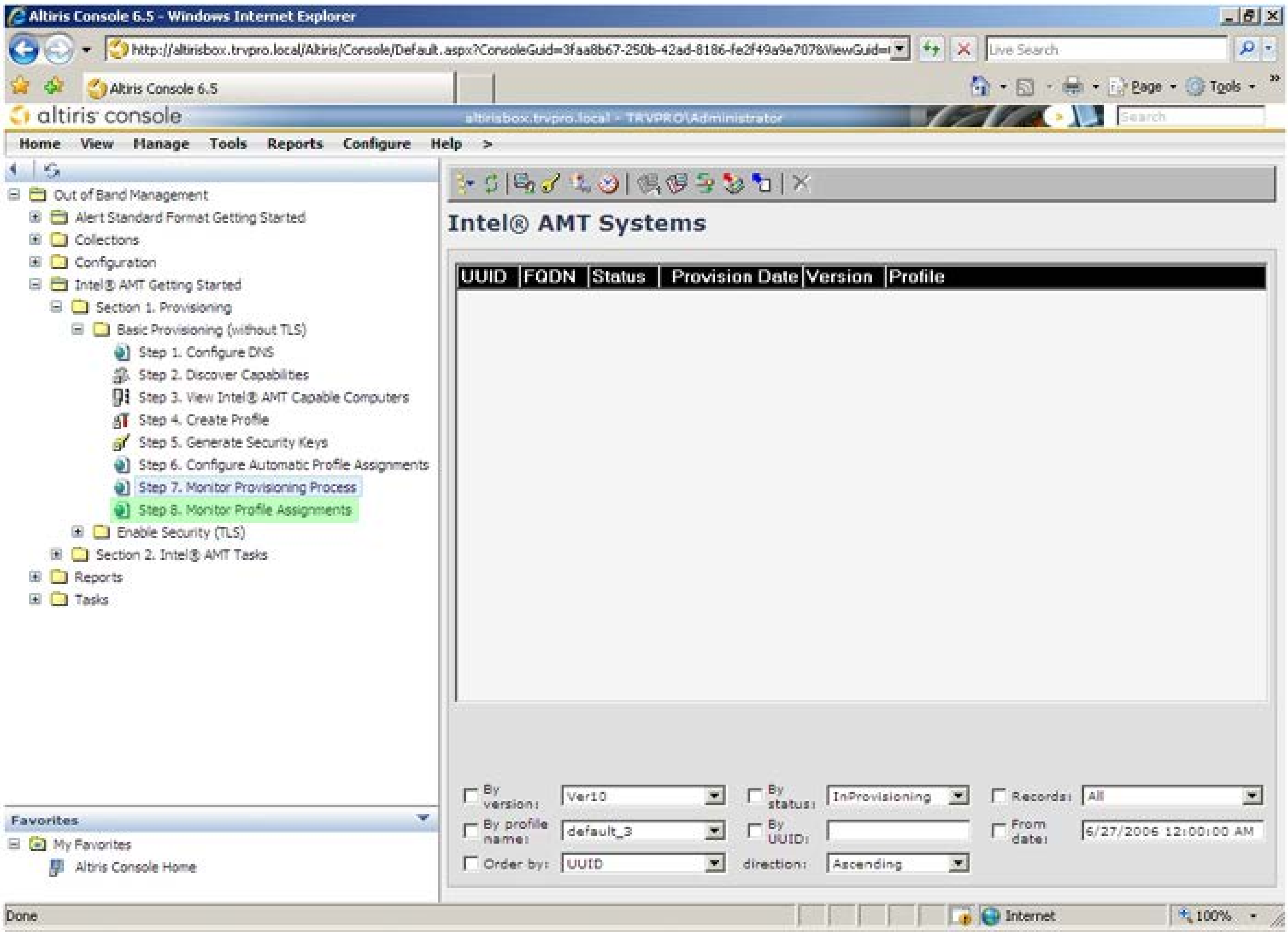
27. Select **Step 7. Monitor Provisioning Process**.



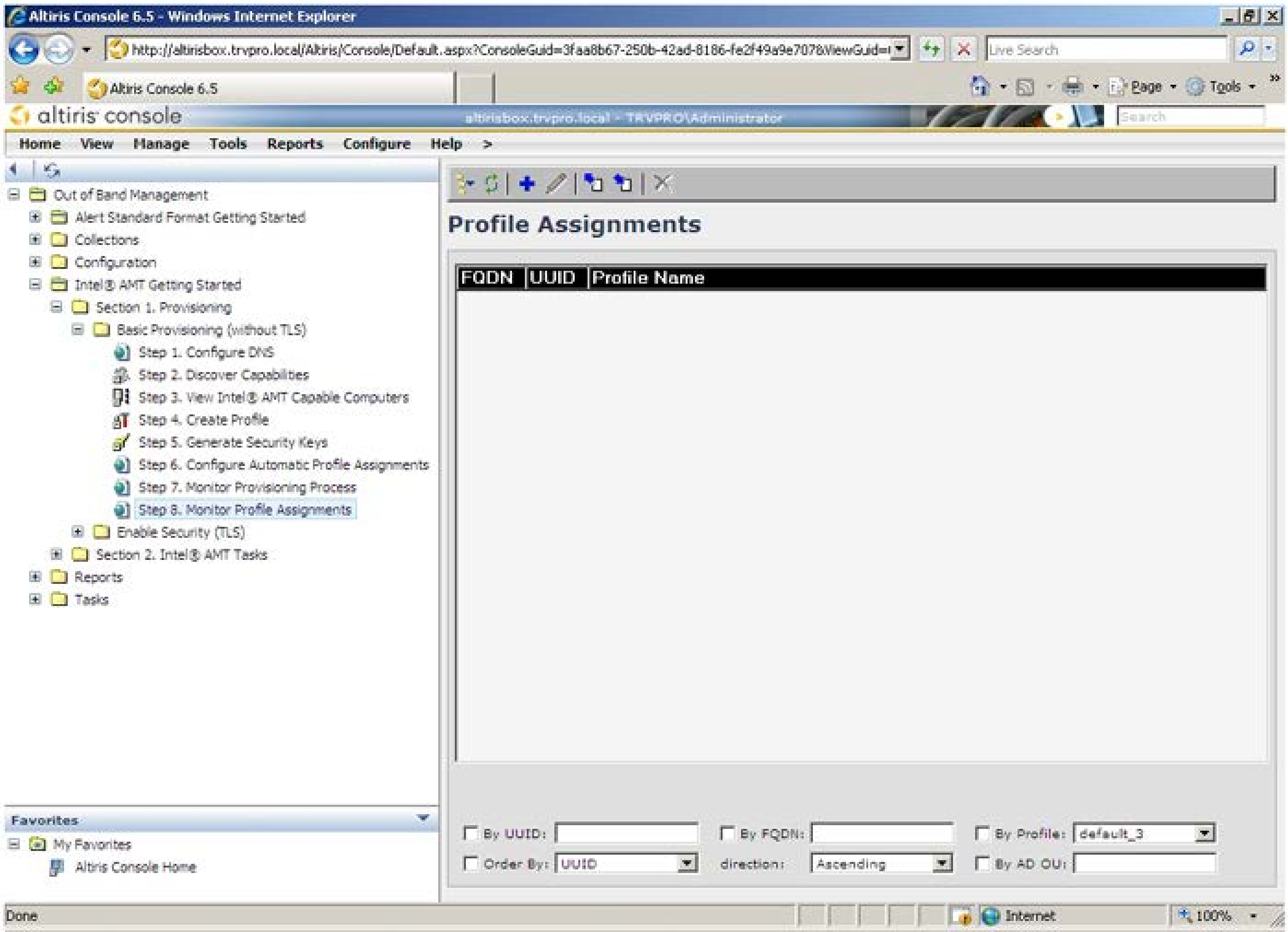
The computers for which the keys were applied begin to appearing in the system list. At first the status is **Unprovisioned**, then the system status changes to **In provisioning**, and finally it changes to **Provisioned** at the end of the process.



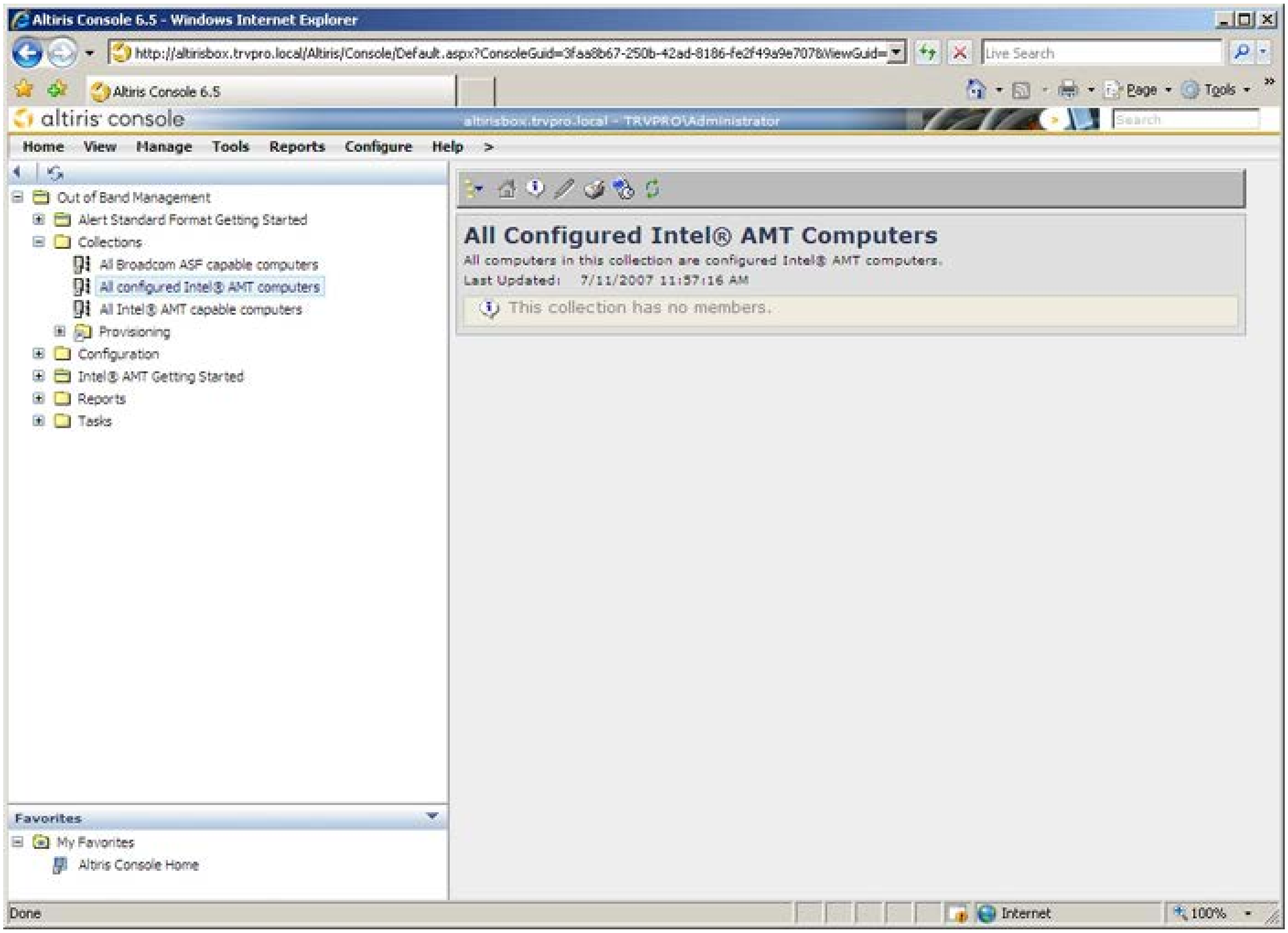
28. Select **Step 8. Monitor Profile Assignments**.



The computers for which profiles were assigned appear in the list. Each computer is identified by the **FQDN**, **UUID**, and **Profile Name** columns.



Once the computers are provisioned, they are visible under the **Collections** folder in **All configured Intel AMT computers**.



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MEBx Interface--Enterprise Mode Setup

The Intel® Management Engine BIOS Extension (MEBx) is an optional ROM module that Intel provides to Dell™ to be included in the Dell BIOS. The MEBx has been customized for Dell computers.

Enterprise mode (for large corporate customers) requires a setup and configuration server (SCS). An SCS runs an application over a network that performs Intel AMT setup and configuration. The SCS is also known as a provisioning server as seen in the MEBx. An SCS is typically provided by independent software vendors (ISVs) and is contained within the ISV management console product. Consult with the management console supplier for more information.

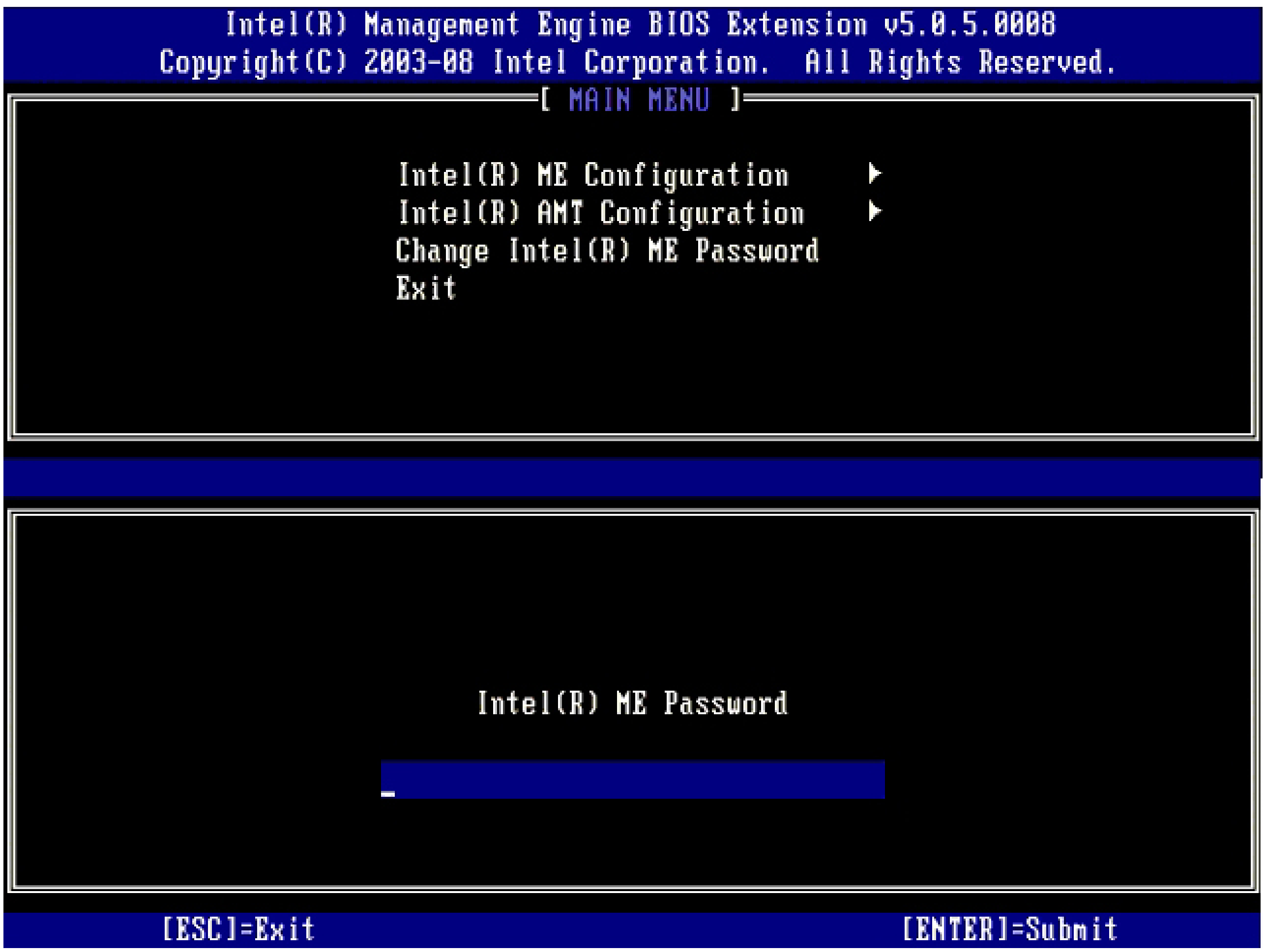
Follow the steps below to set up and configure Intel AMT in the Enterprise mode.

ME Configuration

To enable Intel Management Engine (ME) on the target platform:

1. Press <Ctrl><p> at the Dell logo screen to enter the MEBx screens.
2. Type admin in the **Intel ME Password** field. Press <Enter>. Passwords are case sensitive.

   You must change the default password before making changes to the MEBx options.

3. Select **Change Intel ME Password**. Press <Enter>. Type the new password twice for verification.

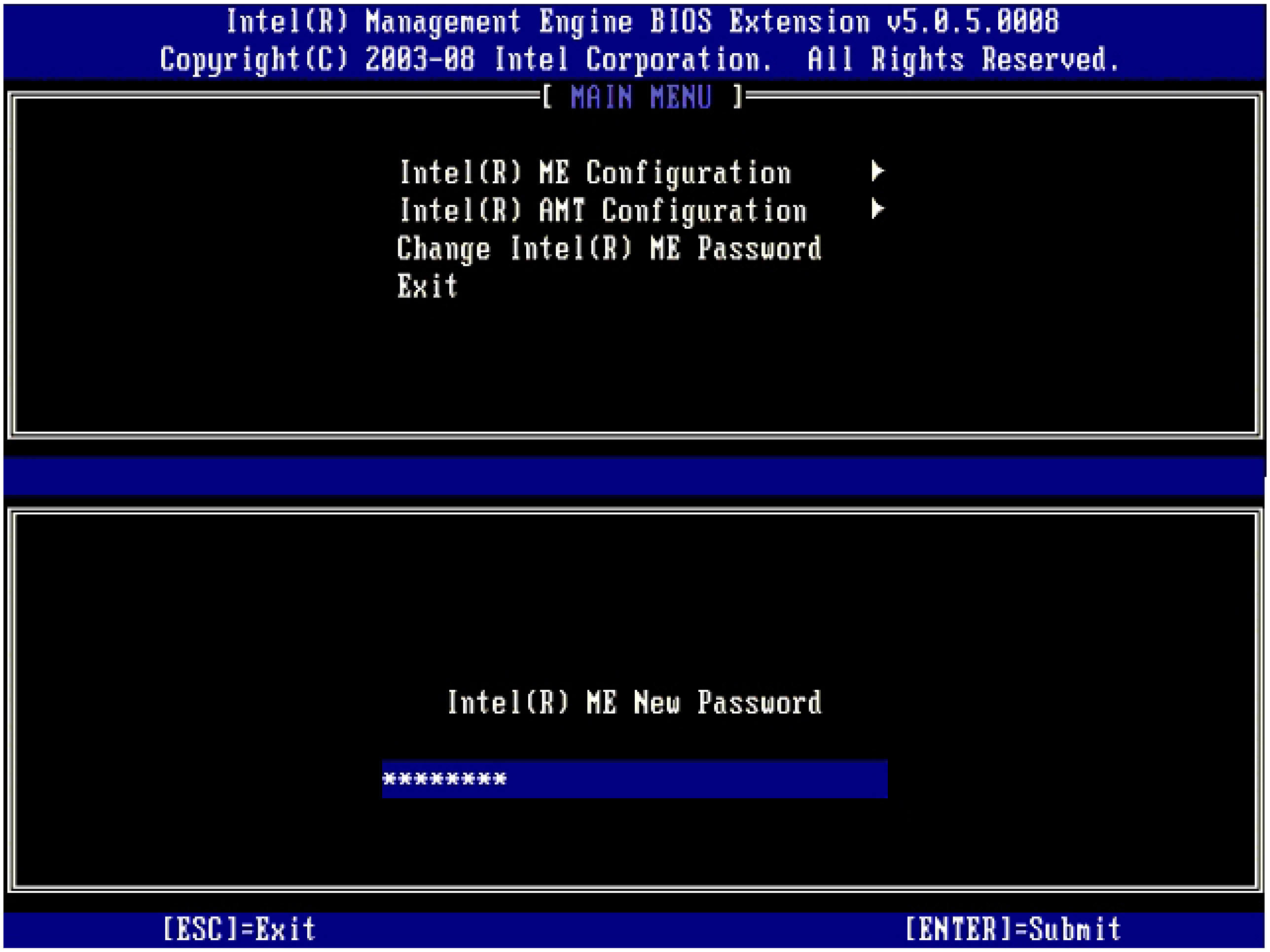
   The new password must include the following elements:

   - Eight characters
   - One uppercase letter

- One lowercase letter
- A number
- A special (nonalphanumeric) character, such as !, $, or ; excluding the :, ", and , characters.)

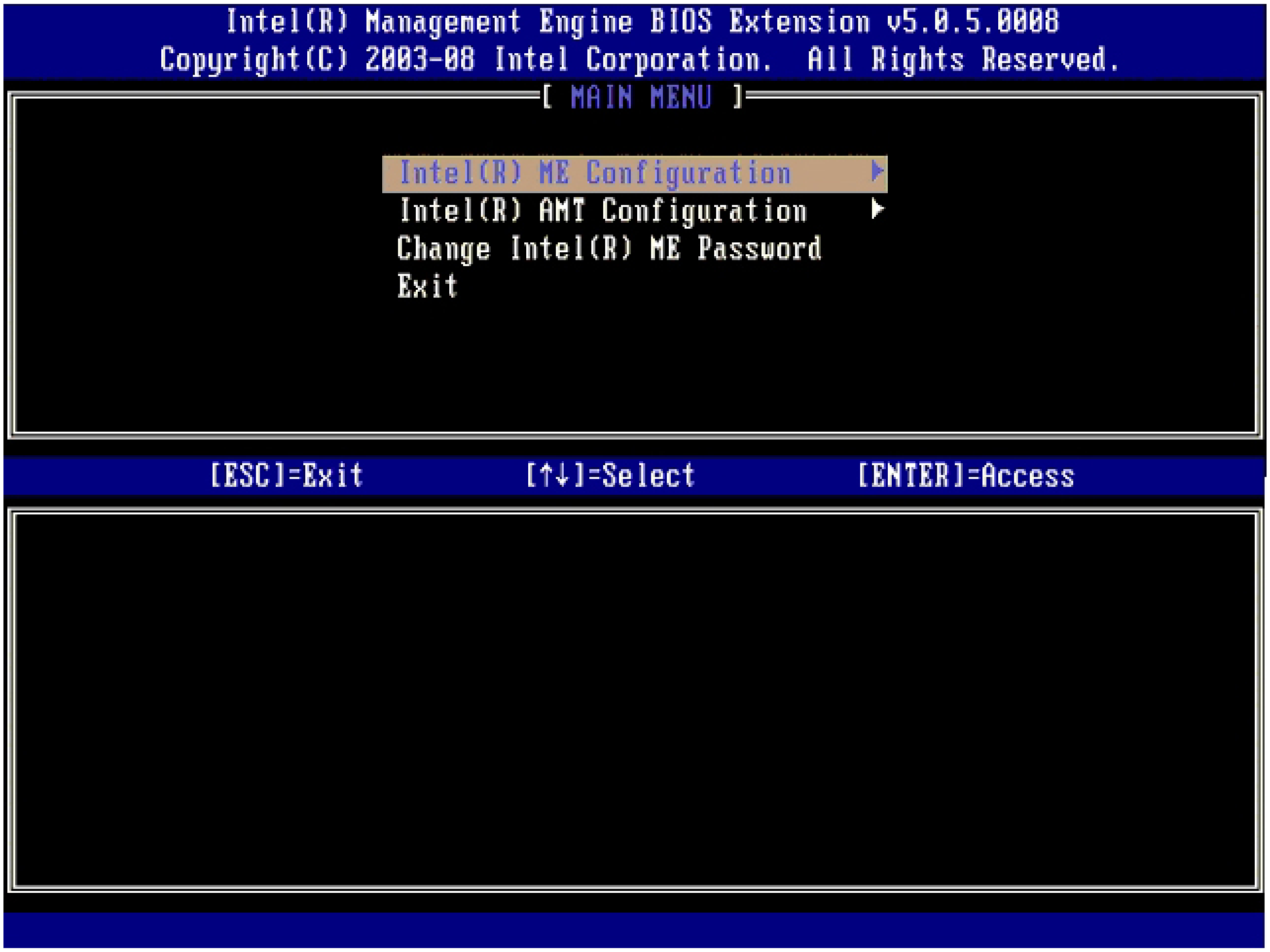
The underscore (_) and spacebar are valid password characters but do NOT add to the password complexity.

4. Change the password to establish Intel AMT ownership. The computer then goes from the factory-default state to the setup state.

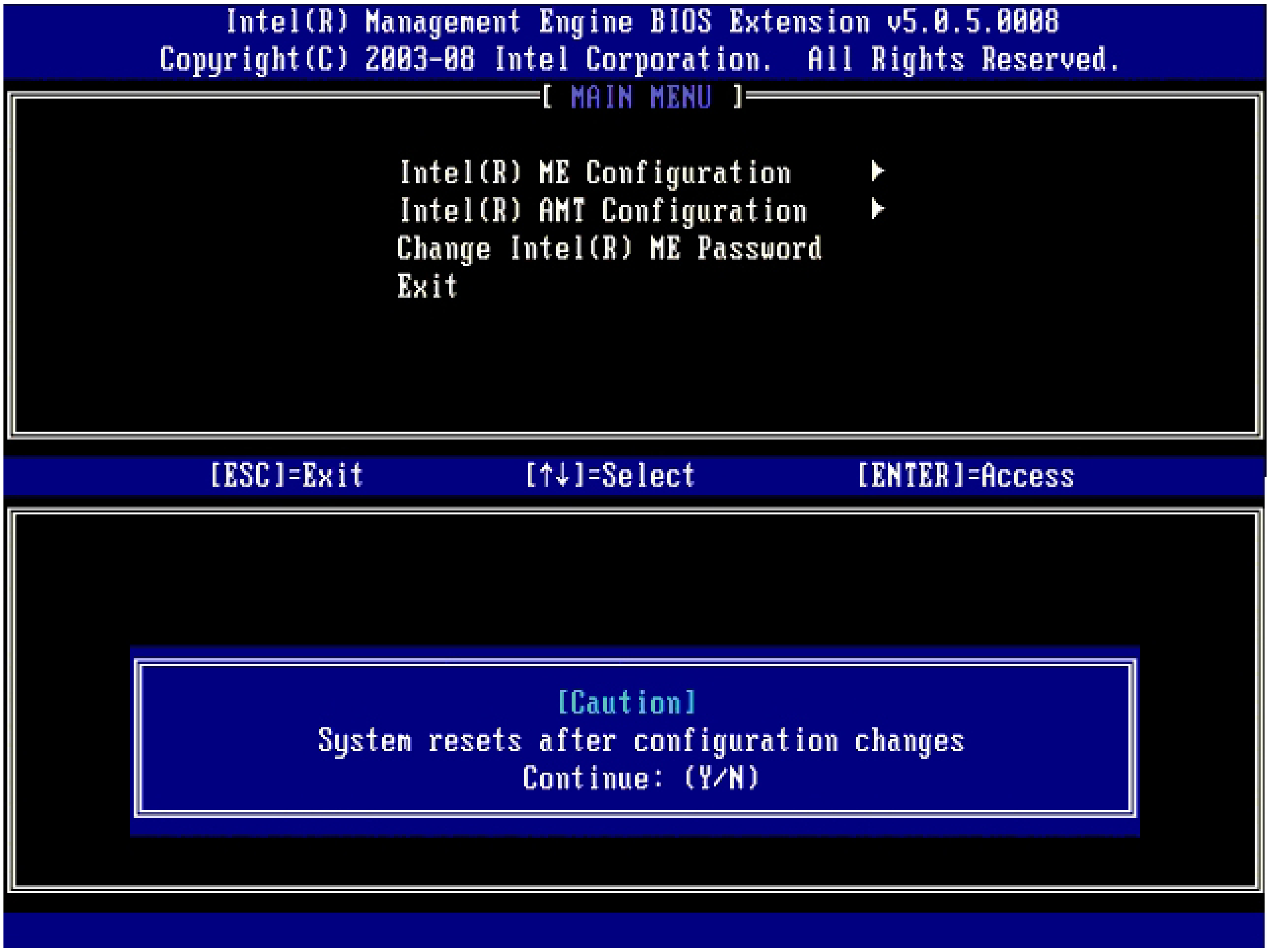


5. Select **Intel ME Configuration**, and then press <Enter>.

   ME Platform Configuration allows you to configure ME features such as power options, firmware update capabilities, and so on.



6. Press <y> when the following message appears:
   `System resets after configuration change. Continue (Y/N).`

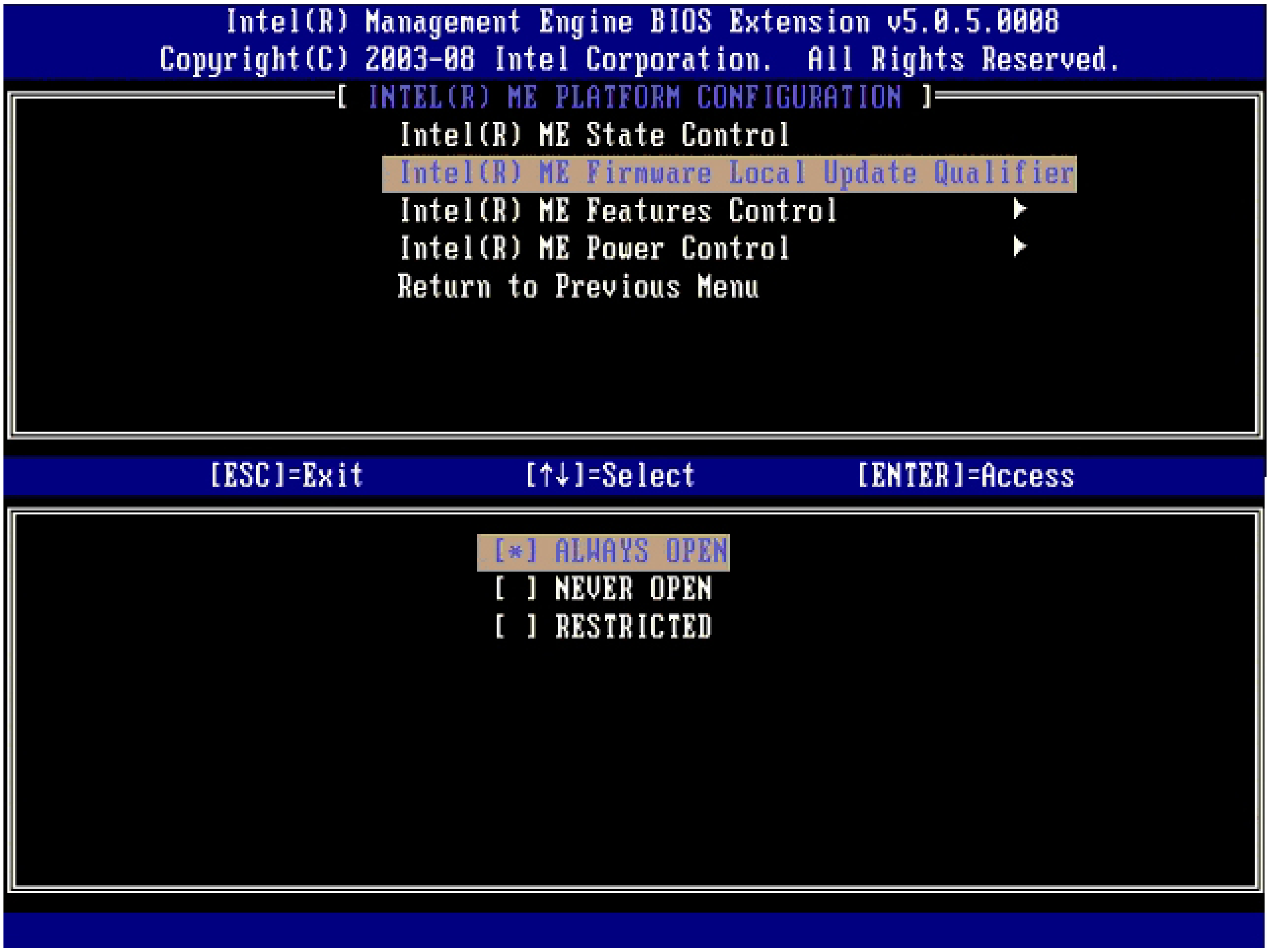


Intel ME State Control is the next option. The default setting for this option is **Enabled**. Do not change this setting to **Disabled**. If you want to disable Intel AMT, change the **Manageability Feature Selection** option to **None** in step 9.

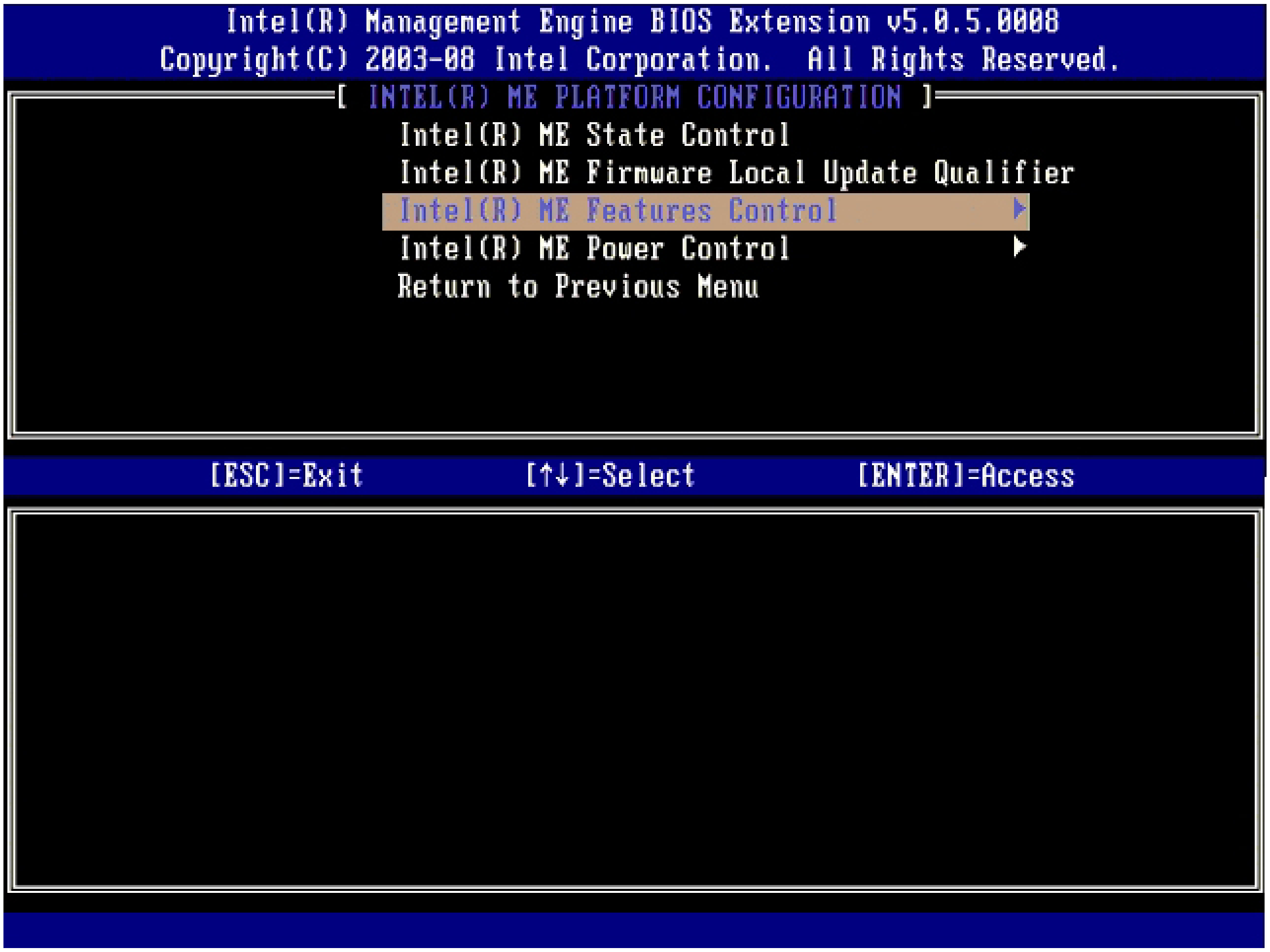


7. Select **Intel ME Firmware Local Update Qualifier**. Press <Enter>.
8. Then select either **Always Open**, **Never Open**, or **Restricted**. Press <Enter>.

   The default setting for this option is **Always Open**.

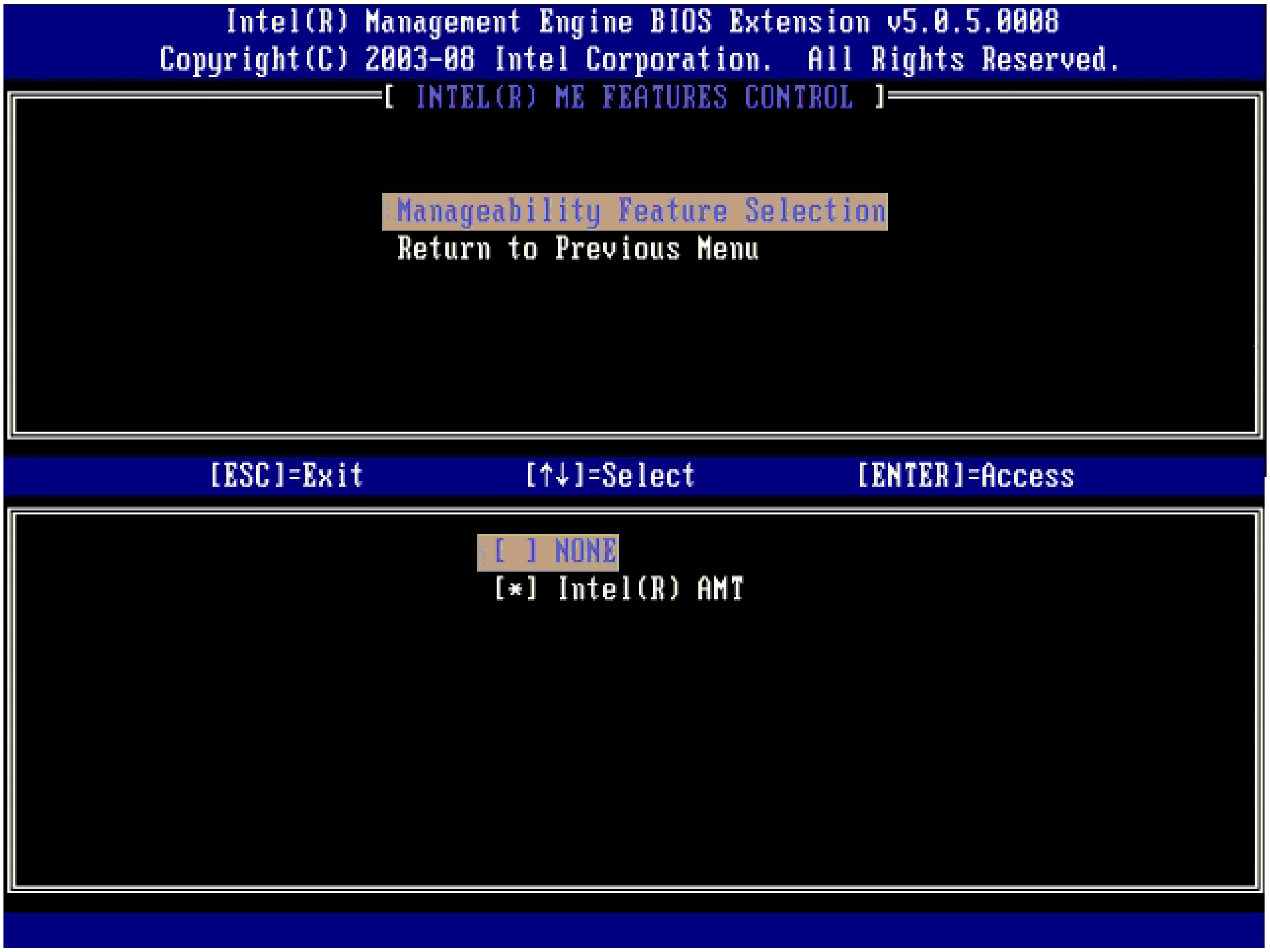


9. Select **Intel ME Features Control**, and then press <Enter>.

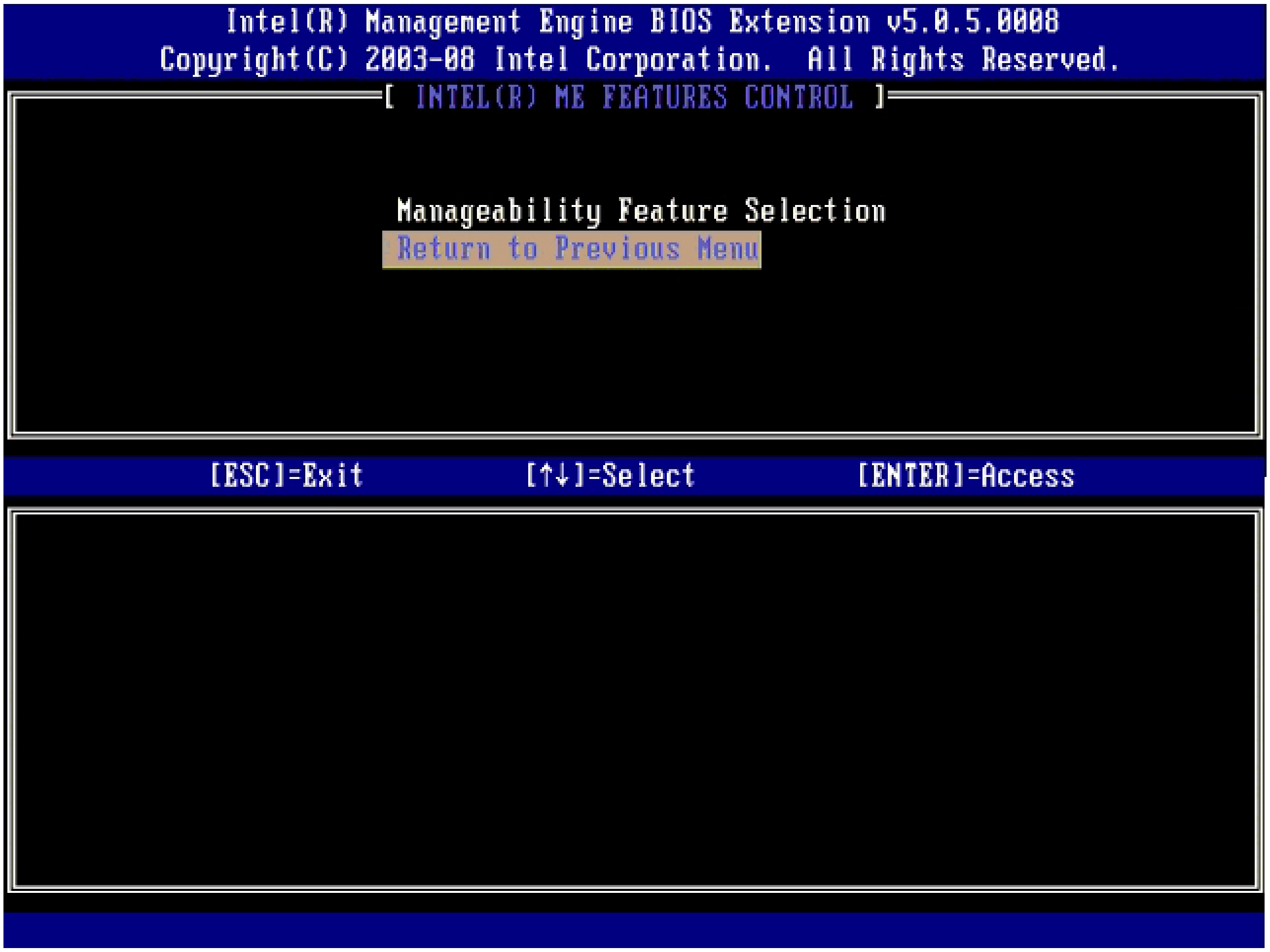


Manageability Feature Selection is the next option. This feature sets the platform management mode. The default setting is **Intel AMT**.

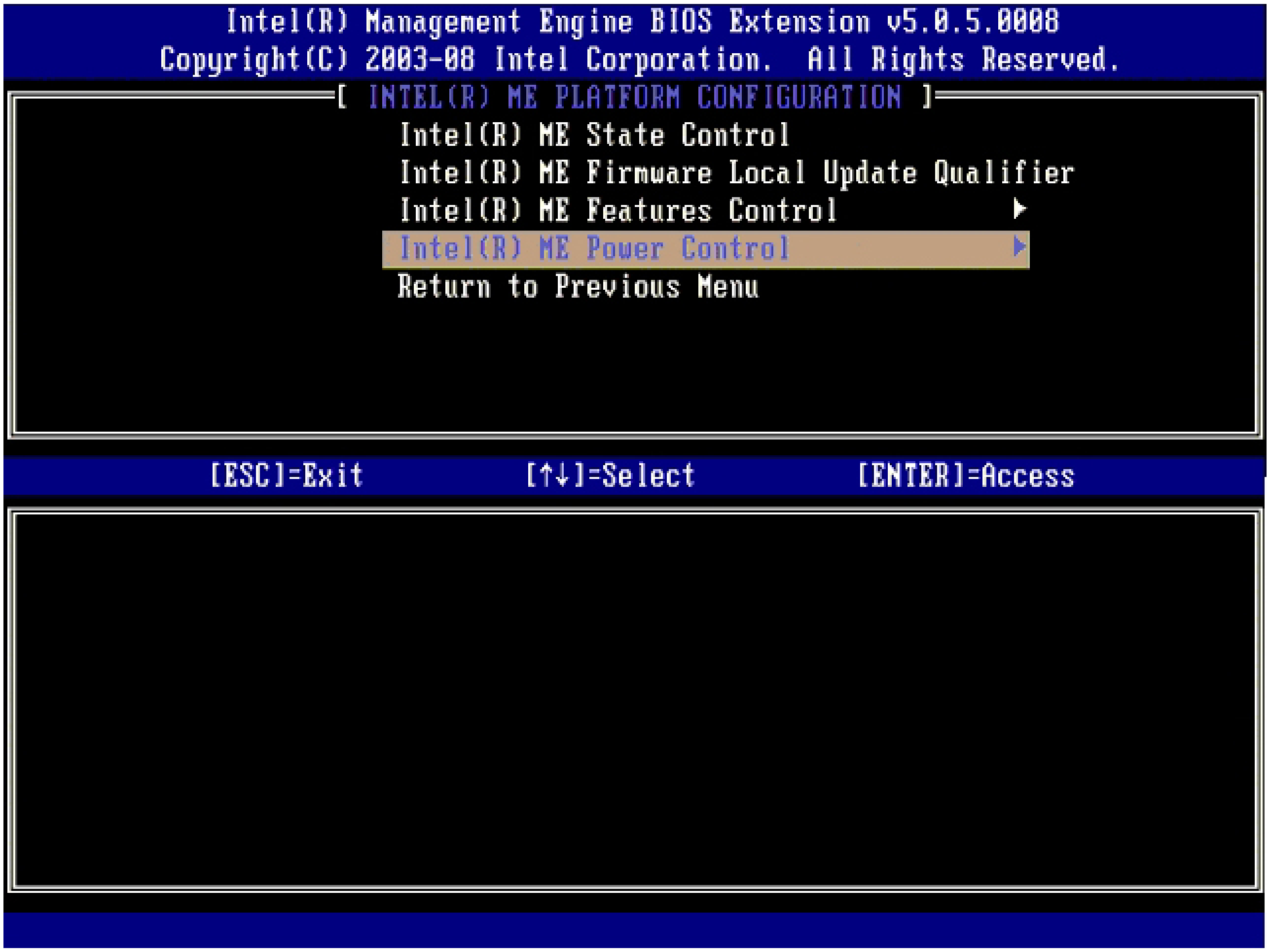
Selecting the **None** option disables all remote management capabilities.



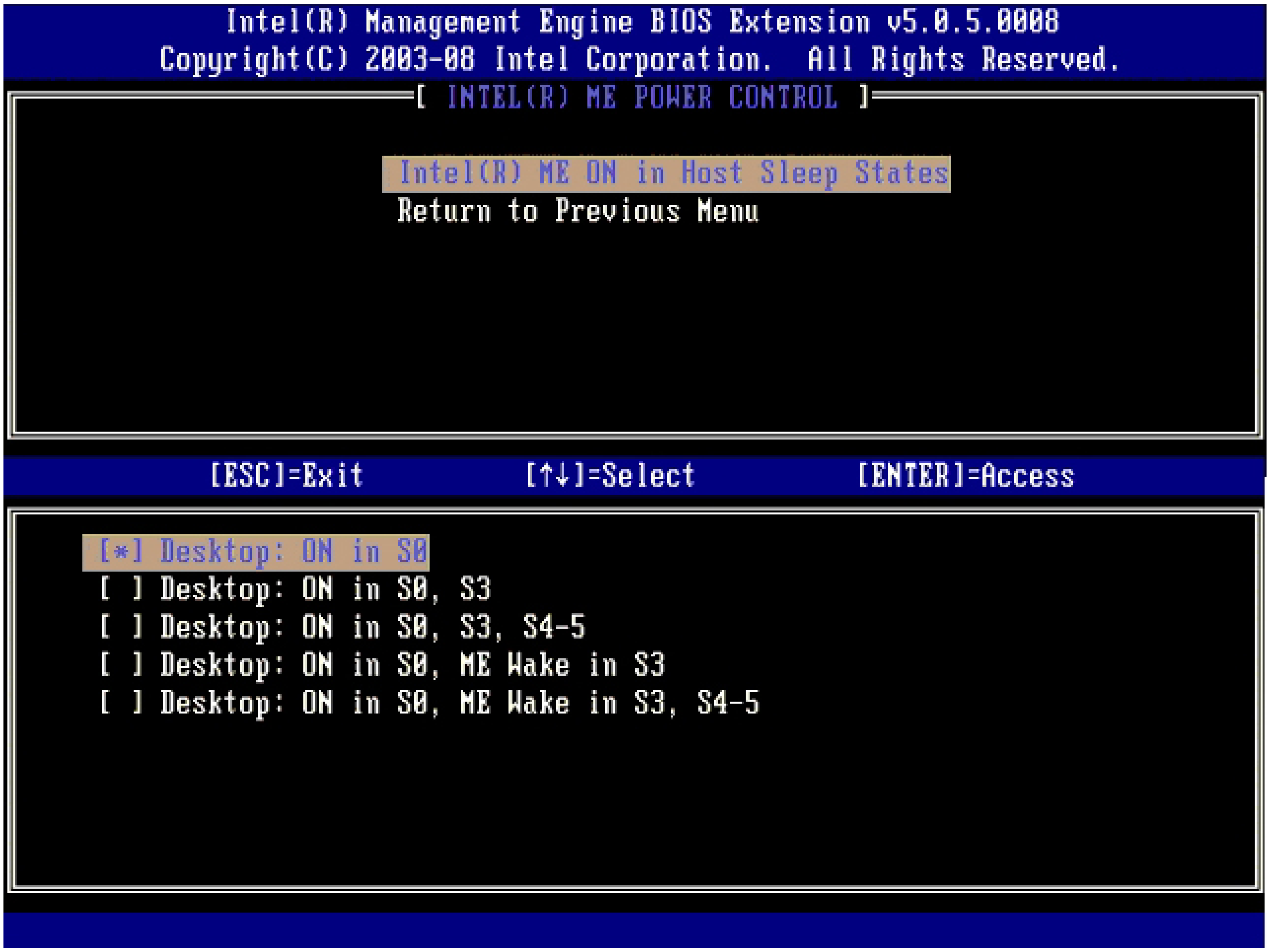
10. Select **Return to Previous Menu**, and then press <Enter>.



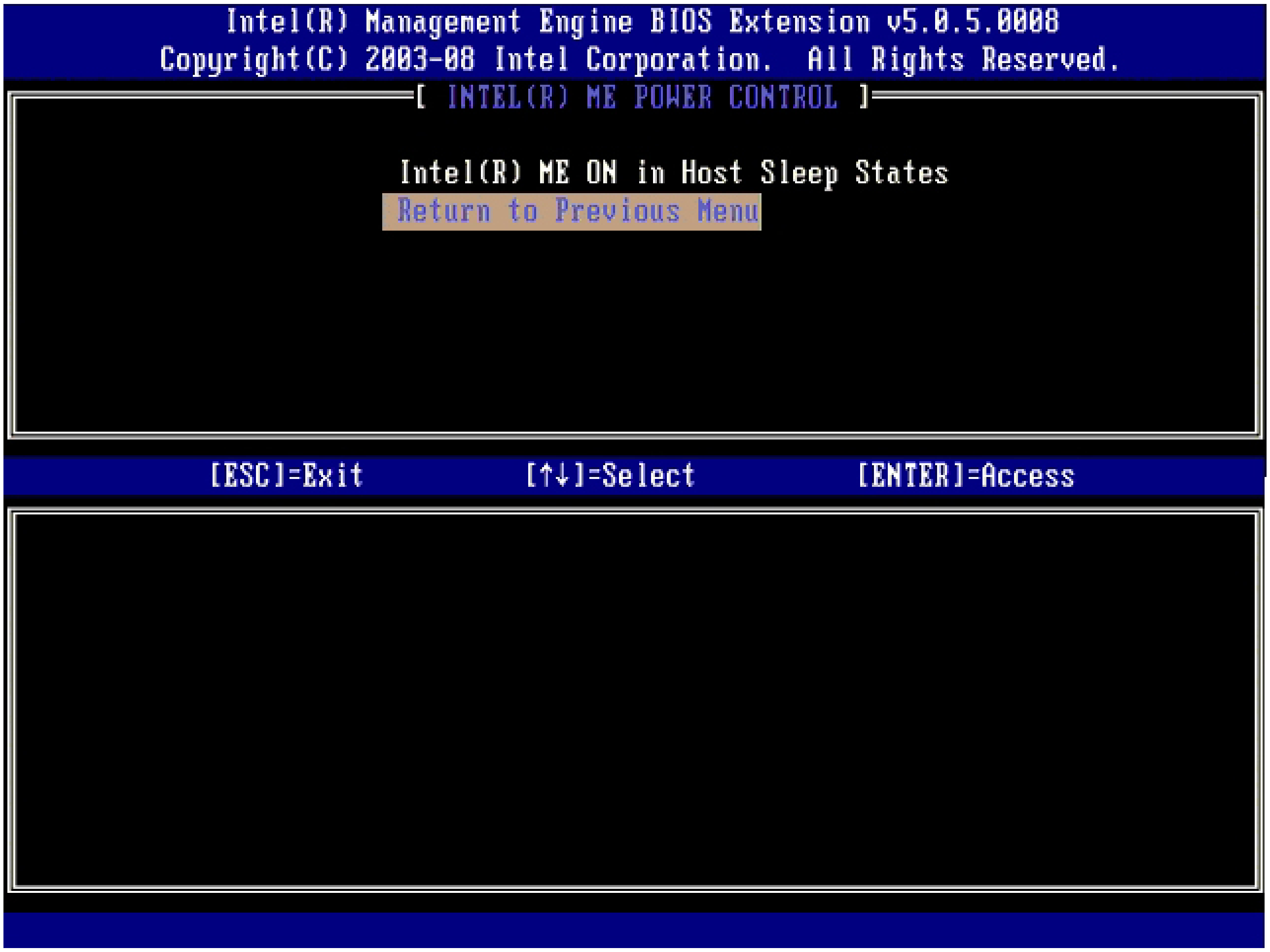
11. Select **Intel ME Power Control**, and then press <Enter>.



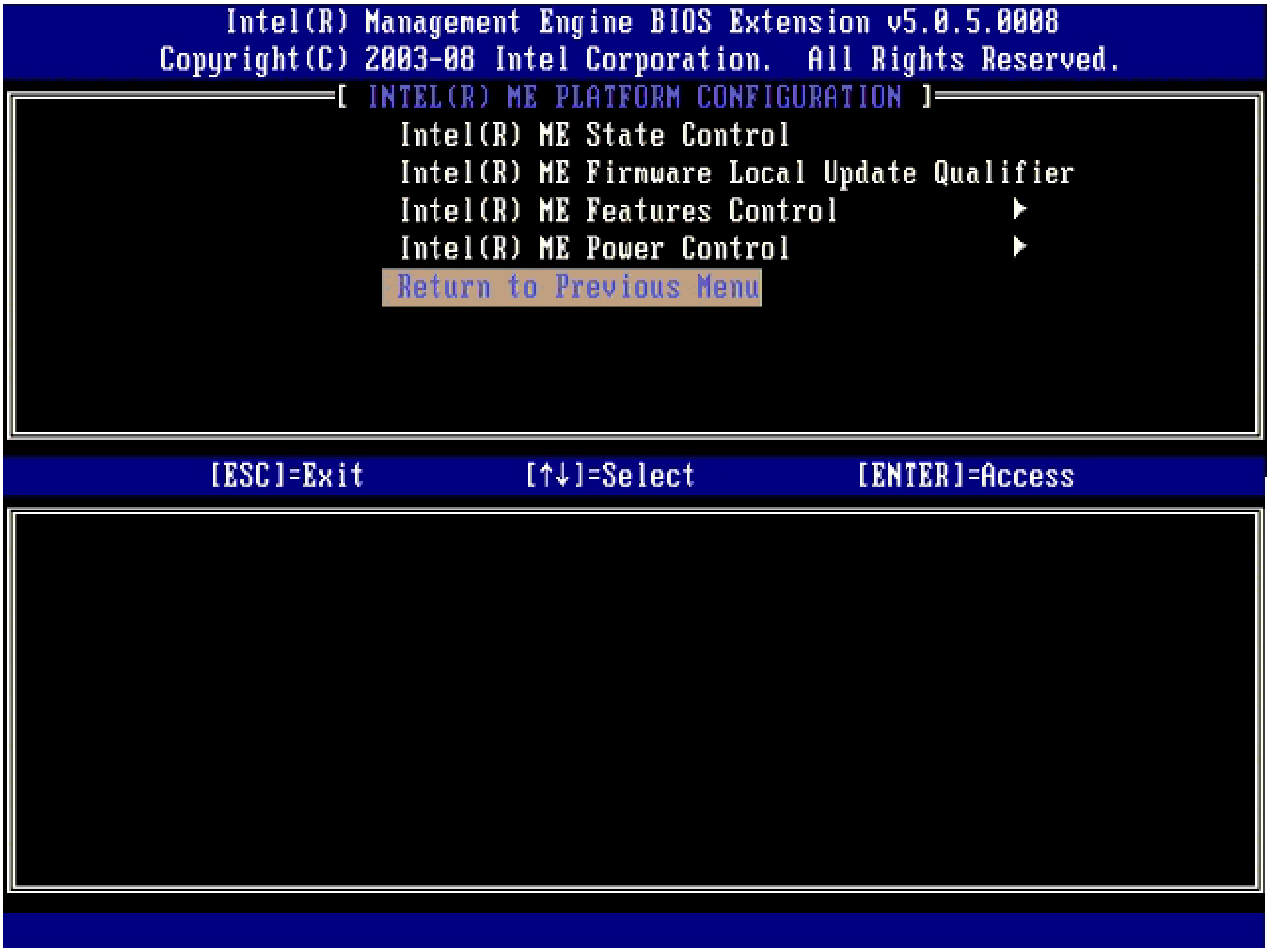
Intel ME ON in Host Sleep States is the next option. The default setting is **Mobile: ON in S0**.



12. Select **Return to Previous Menu**, and then press <Enter>.



13. Select **Return to Previous Menu**, and then press <Enter>.



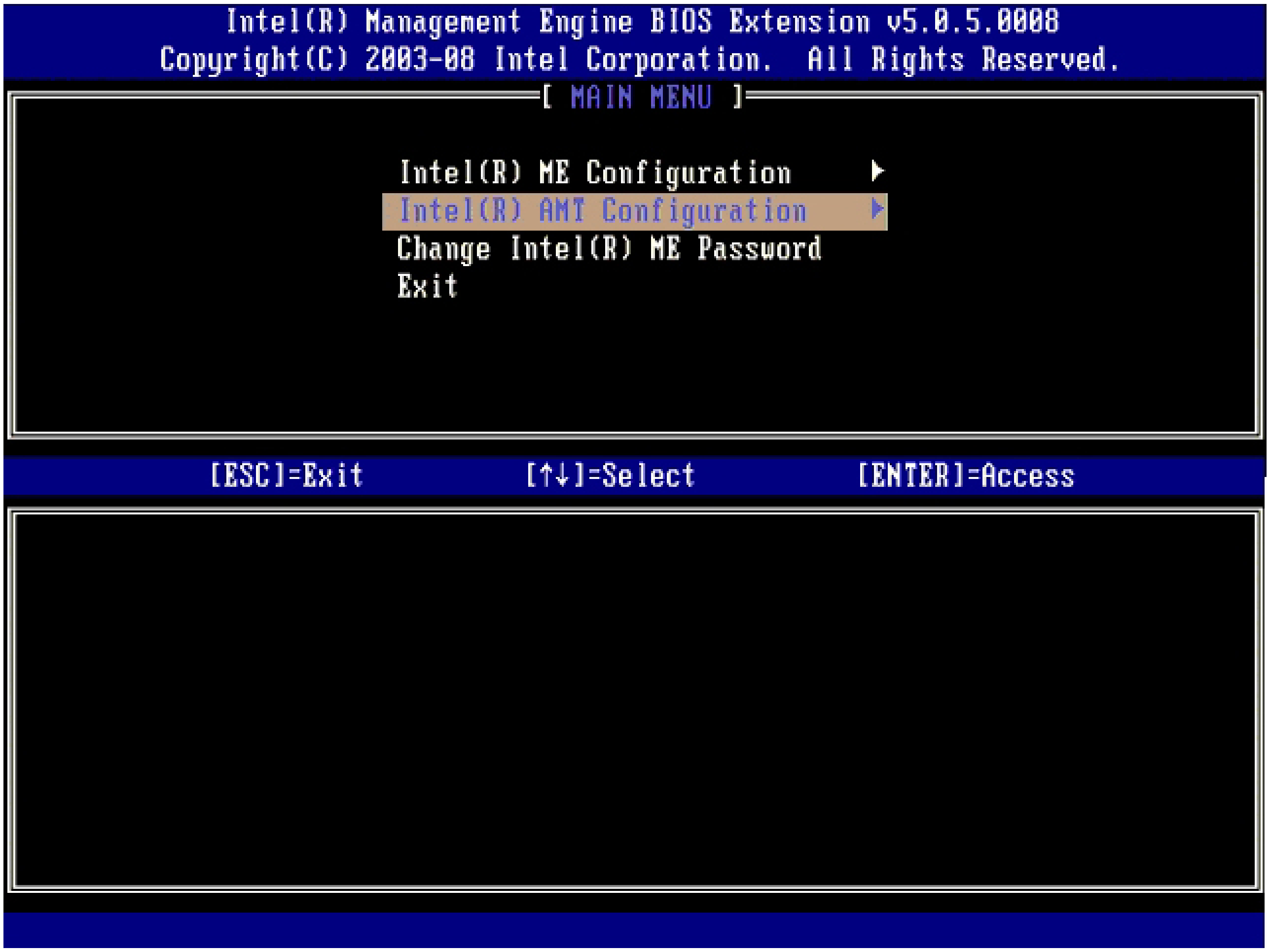
14. Exit the MEBx Setup and save the ME configuration.

    The computer displays an Intel ME Configuration Complete message and then restarts. After the ME configuration is complete, you can configure the Intel AMT settings.

Intel AMT Configuration

To enable **Intel AMT Configuration** settings on the target platform, perform the following steps:

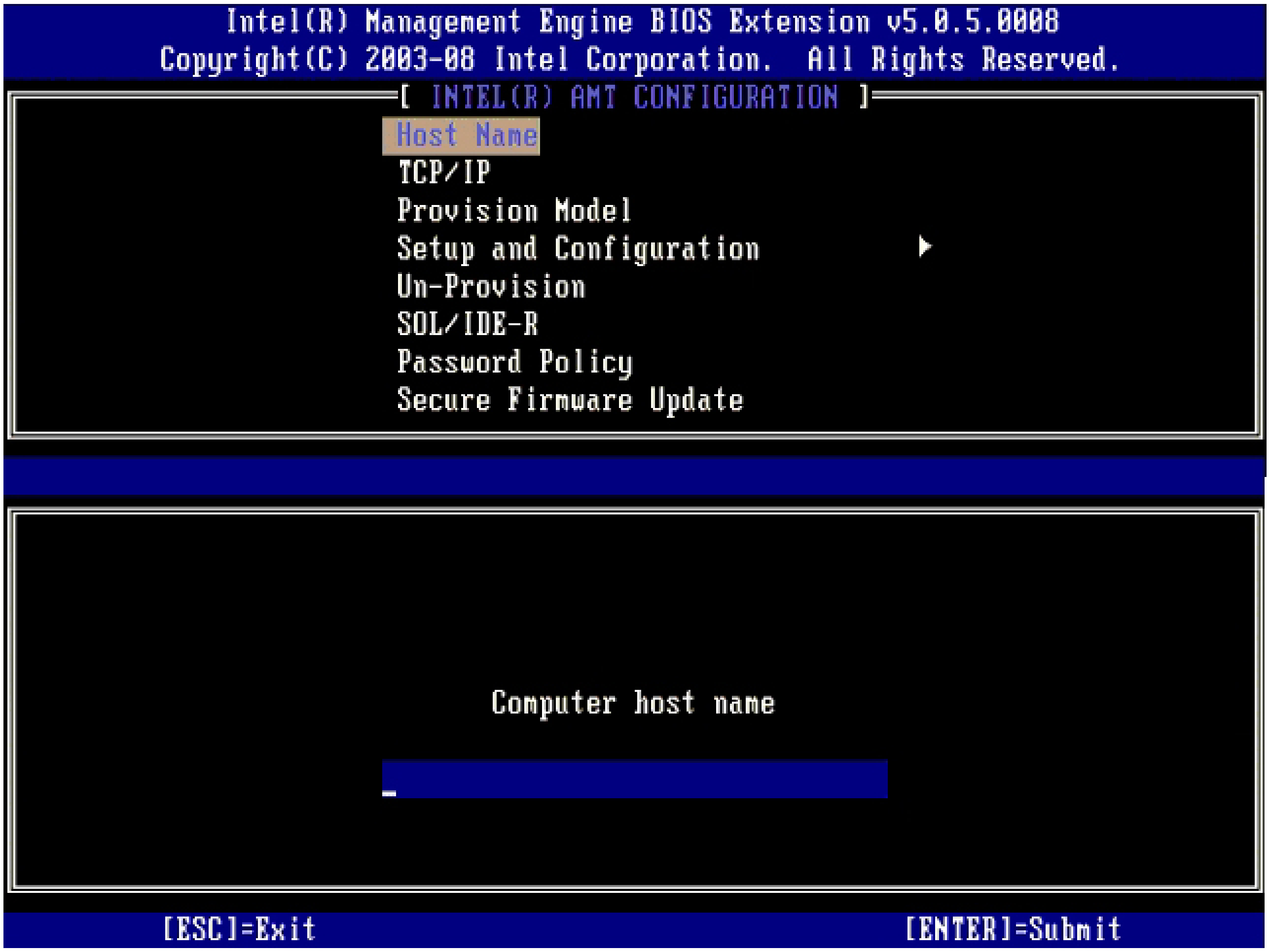
1. At the initial boot screen, press <Ctrl><p> to re-enter the MEBx screens as seen in step 1 of "Enabling Management Engine for Enterprise Mode."
2. When a prompt for the password appears, enter the new Intel ME password.
3. Select **Intel AMT Configuration**, and then press <Enter>.



4. Select **Host Name**, and then press <Enter>.

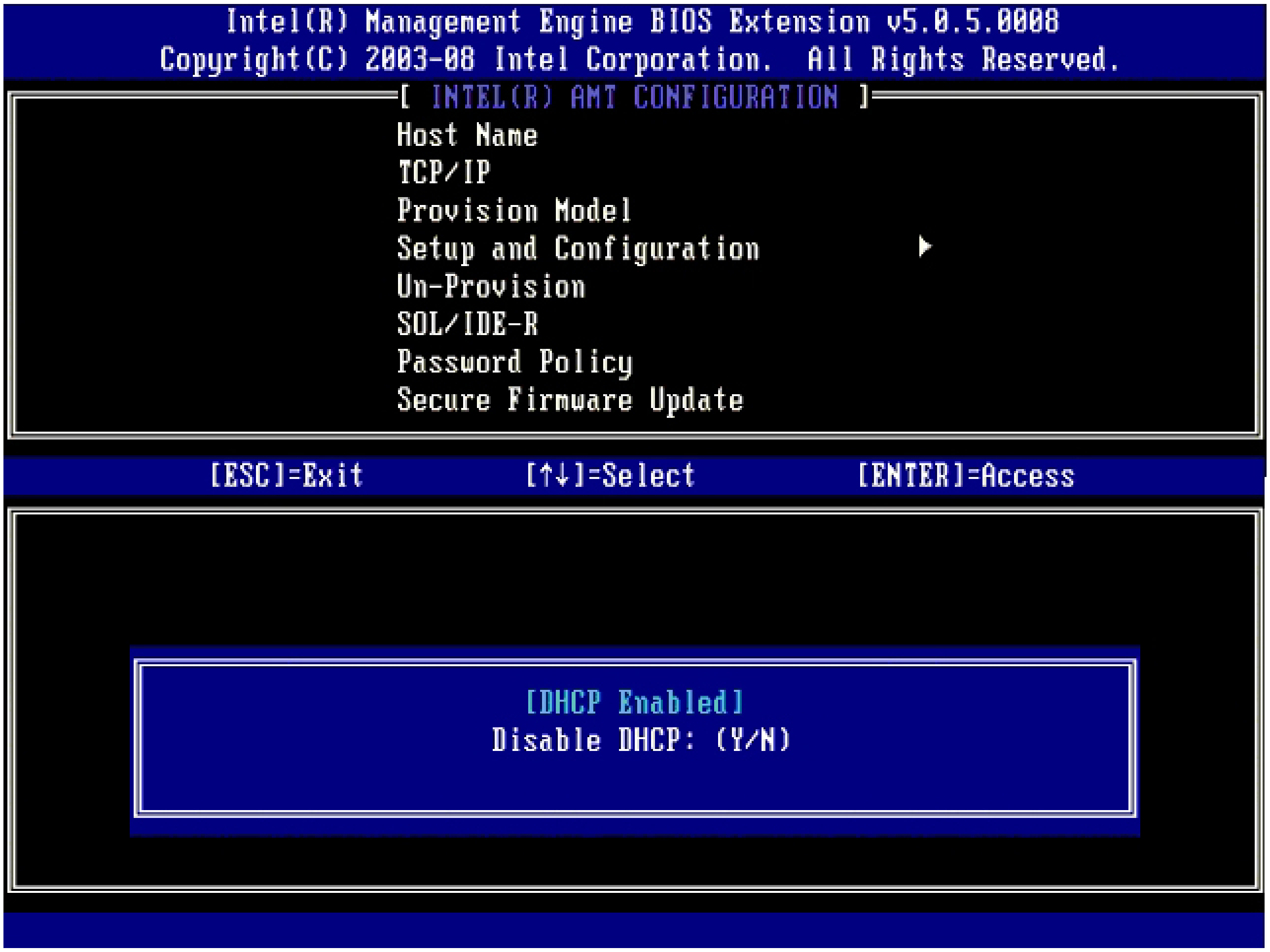
5. Type in a unique name for this Intel AMT machine, and then press <Enter>.

   Spaces are not accepted in the host name. Make sure there is not a duplicate host name on the network. Host names can be used in place of the computer's IP for any applications requiring the IP address.

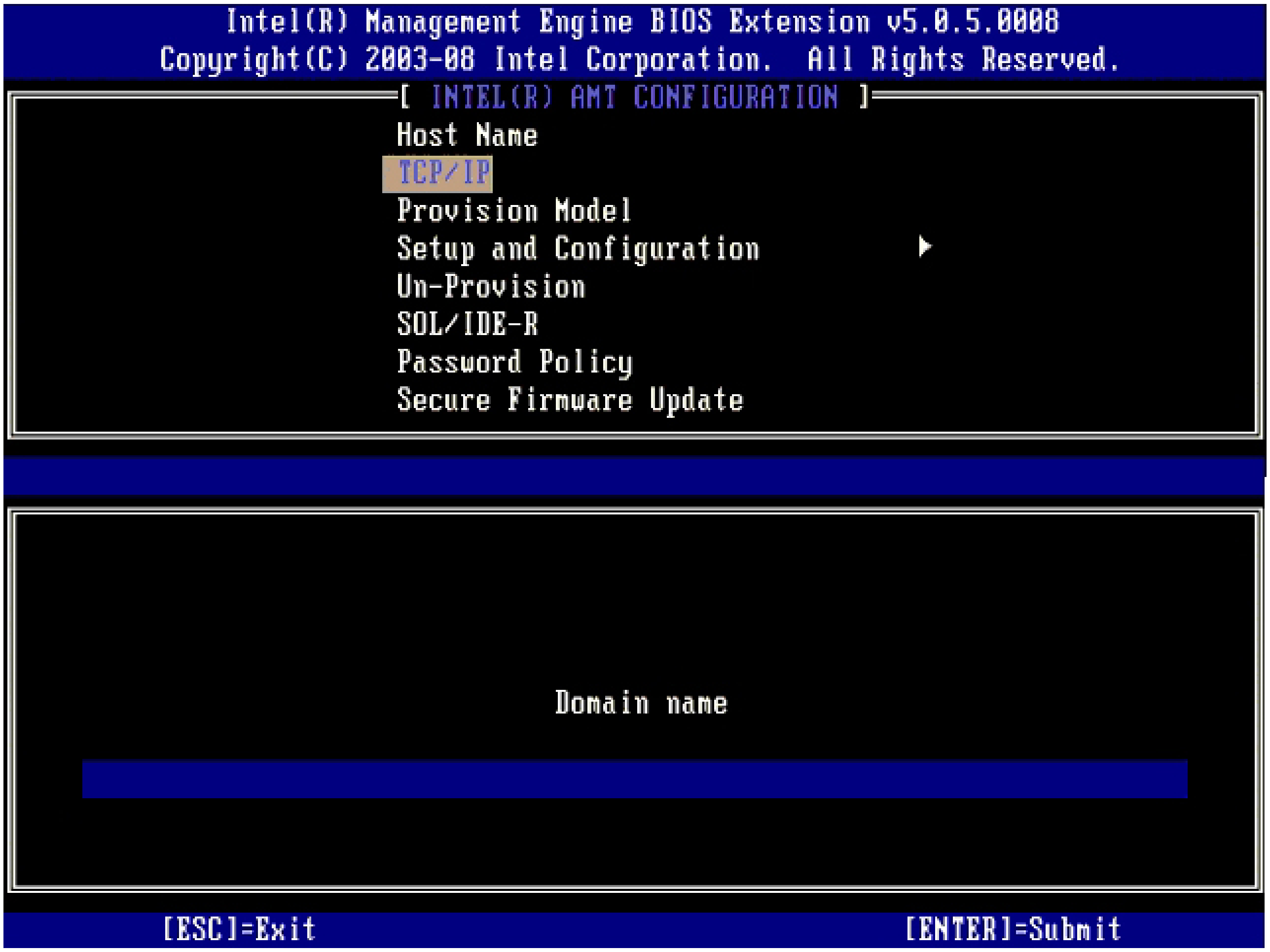


6. Select **TCP/IP**, and then press <Enter>.
7. Press <n>when the following message appears:

```
[DHCP Enable] Disable DHCP (Y/N)
```

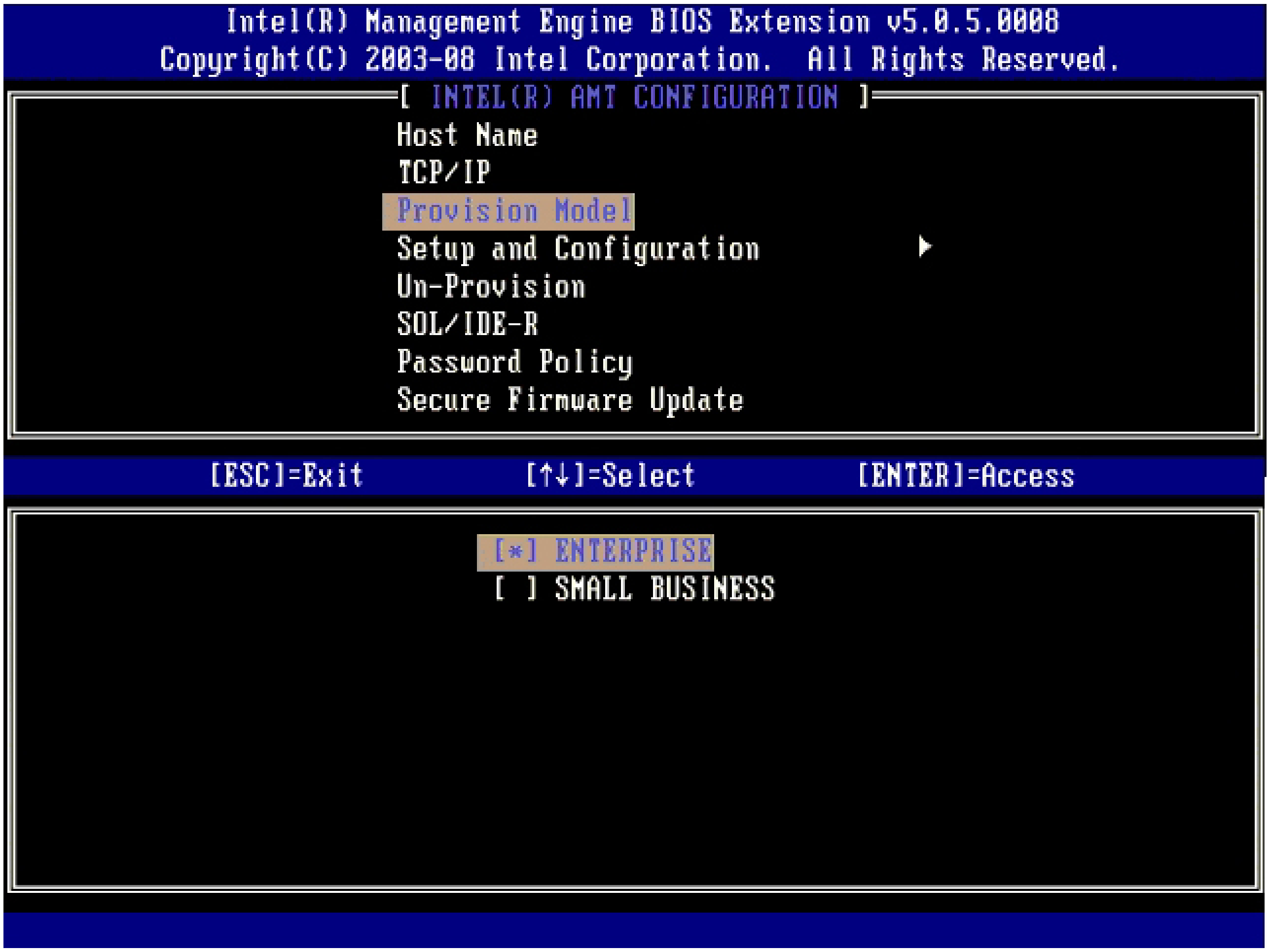


8. Type the domain name into the **Domain name** field.

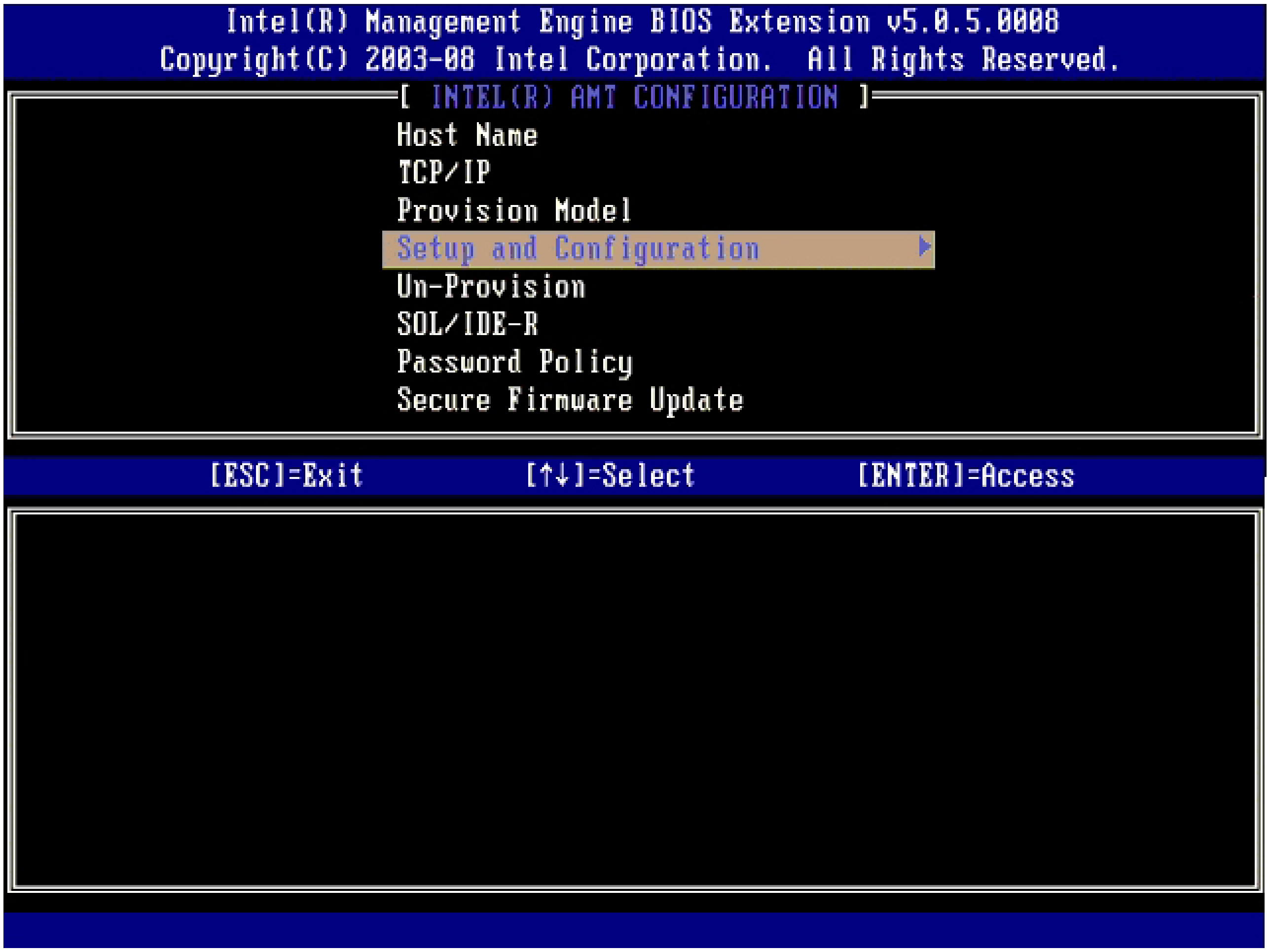


9. Select **Provision Model** from the menu, and then press <Enter>.

10. Choose between an **Enterprise** or **Small Business** configuration. The default setting is **Enterprise**.



11. Select **Setup and Configuration** from the menu, and then press <Enter>.



12. Select **Current Provisioning Mode** to display the current mode, and then press <Enter>.

    The current provisioning mode is displayed. Press <Enter> or <Esc> to exit.



13. Select **Provisioning Record** from the menu, and then press <Enter>.

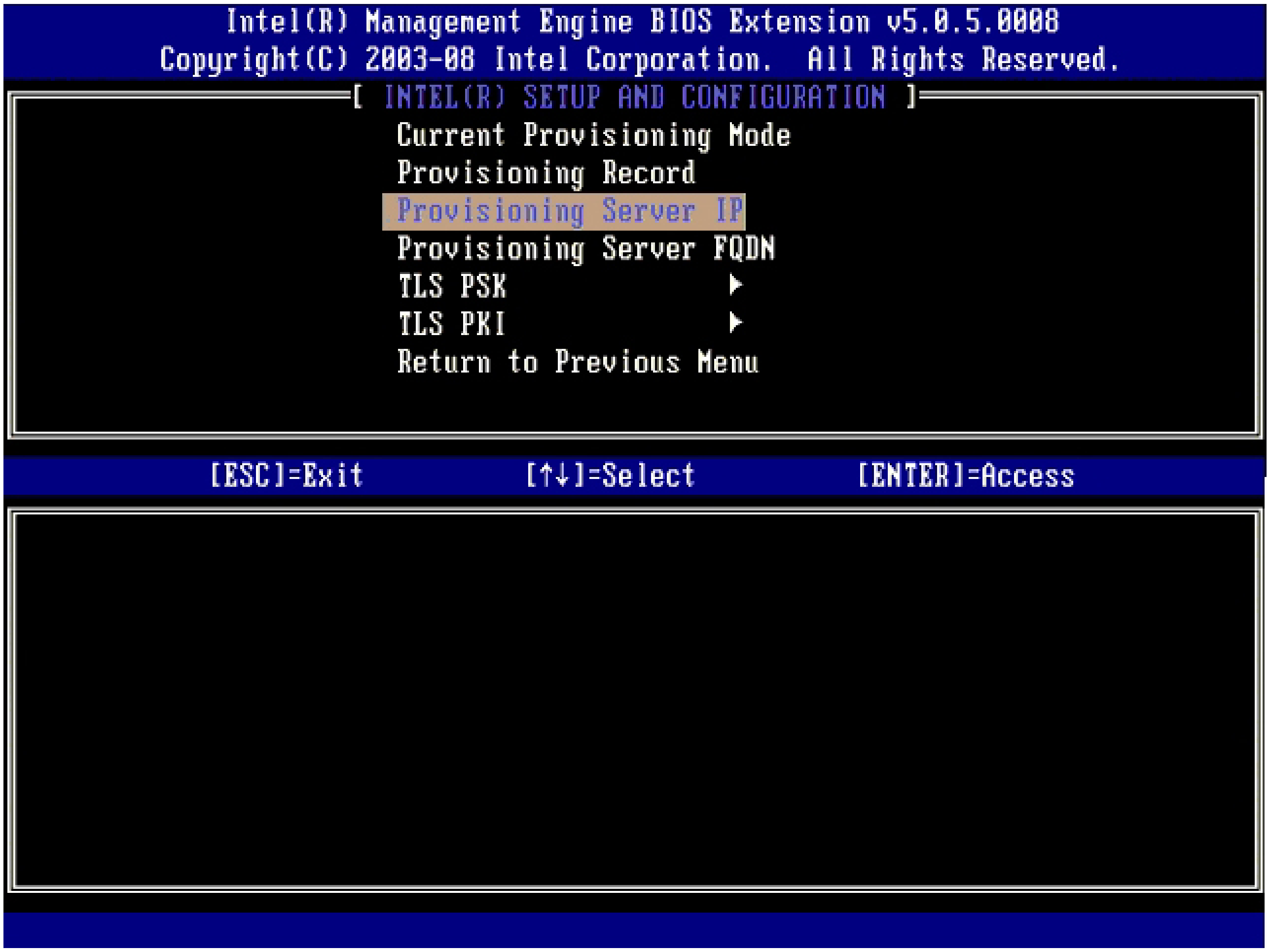
    The screen displays the provision PSK/PKI record data of the computer. If the data has not been entered, the MEBX displays a message that states

    ```
    Provision Record not present
    ```

    If the data is entered, the **Provision Record** displays one of several messages.

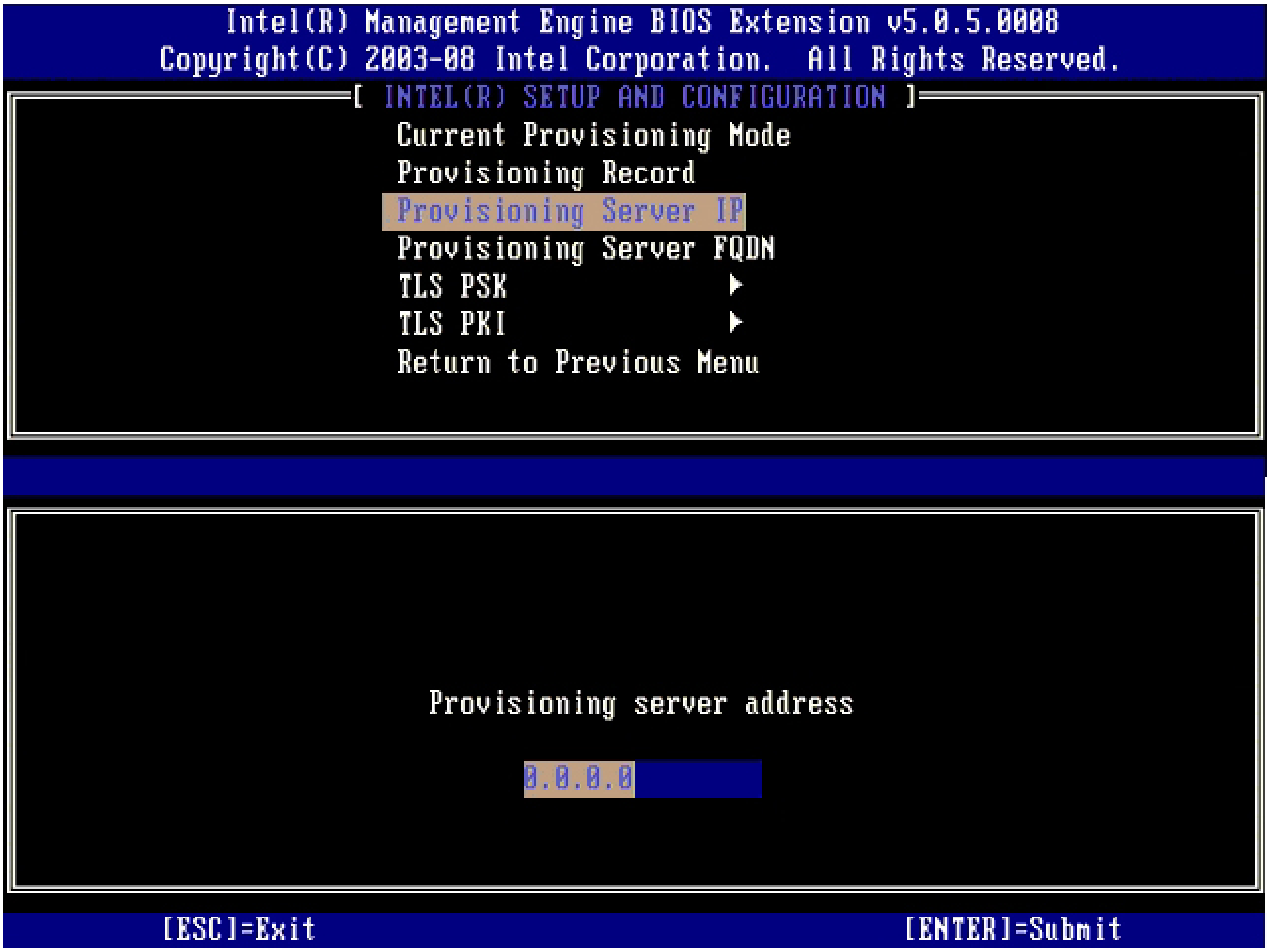


14. Select **Provisioning Server** from the menu, and then press <Enter>.



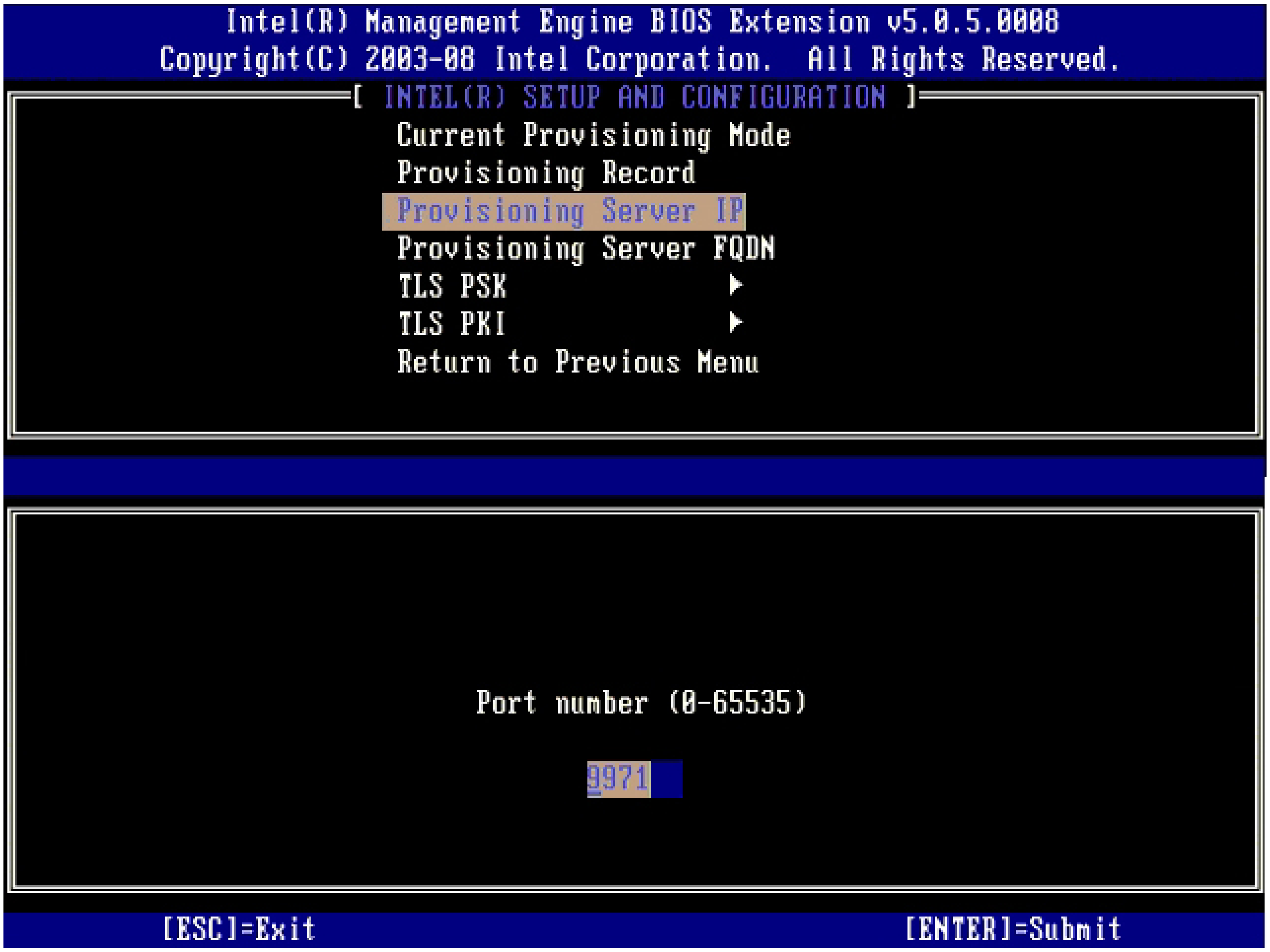
15. Type the provisioning server IP in the **Provisioning server address** field and press <Enter>.

    The default setting is 0.0.0.0. This default setting works only if the DNS server has an entry that can resolve the provision server to the IP of the provisioning server.

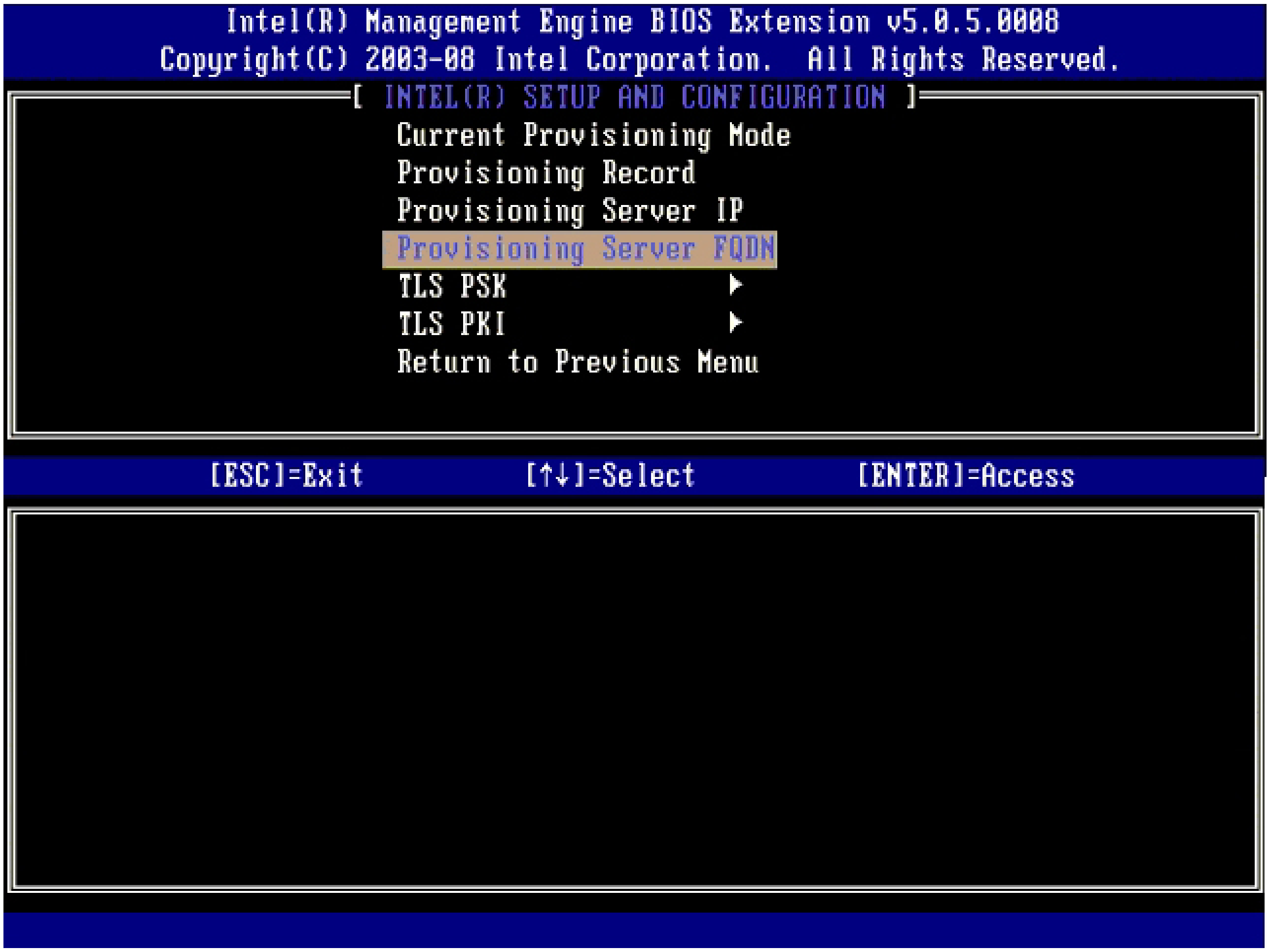


16. Type the port number in the **Port number** field and press <Enter>.

    The default setting is 0. If left at the default setting of 0, the Intel AMT attempts to contact the provisioning server on port 9971. If the provisioning server is listening on a different port, enter it here.



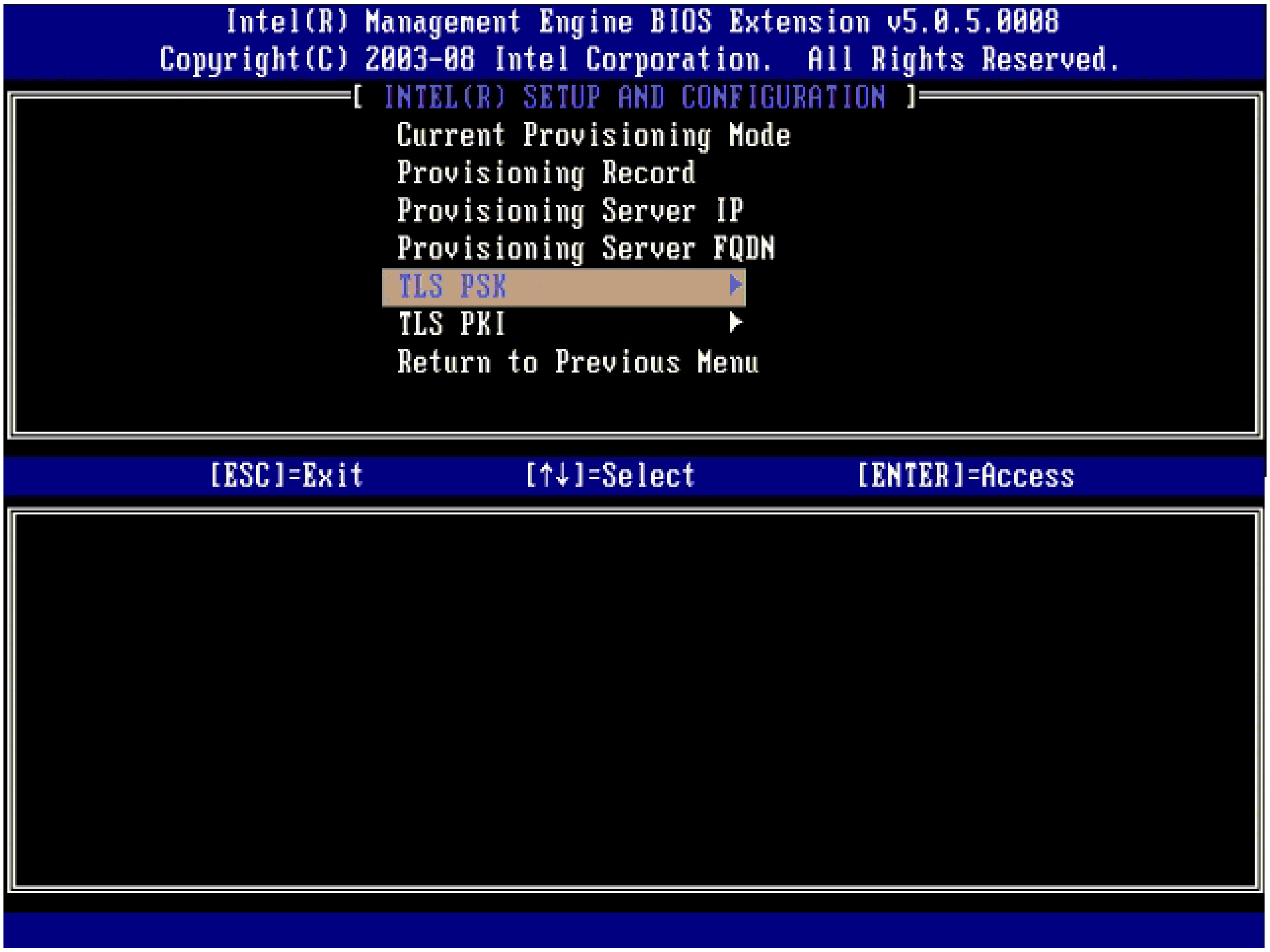
17. Select **Provisioning Server FQDN** from the menu, and then press <Enter>.



18. Type the fully qualified domain name (FQDN) for the provisioning server and press <Enter>.



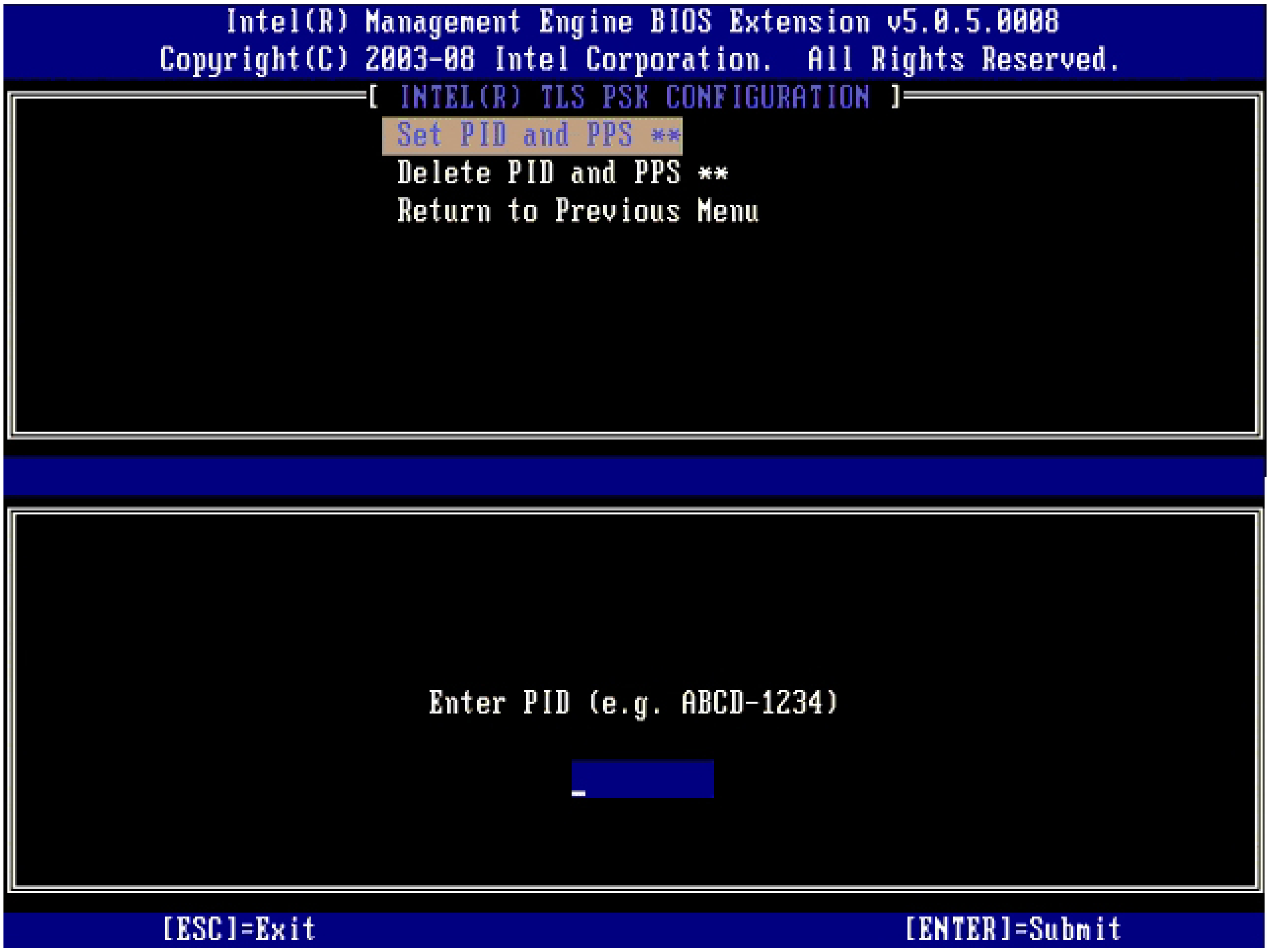
19. Select **TLS PSK** from the menu, and then press <Enter>.



20. **Set PID and PPS** is the next option.

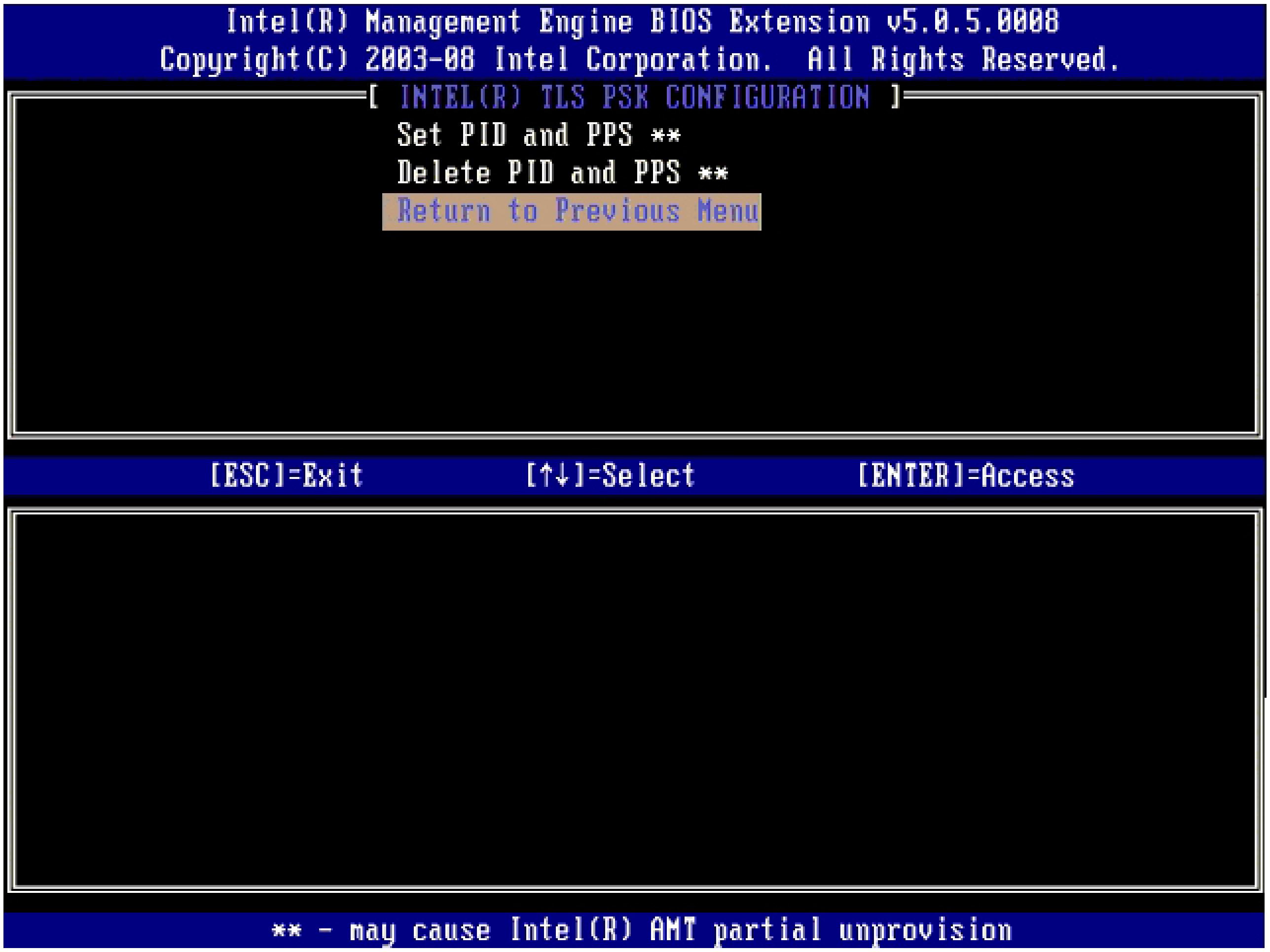
    The PID and PPS can be input manually or by using a USB key once the SCS generates the codes.

    This option is for entering the provisioning ID (PID) and provisioning passphrase (PPS). PIDs are eight characters and PPS are 32 characters. There are dashes between every set of four characters, so including dashes, PIDs are nine characters and PPS are 40 characters. An SCS must generate these entries.

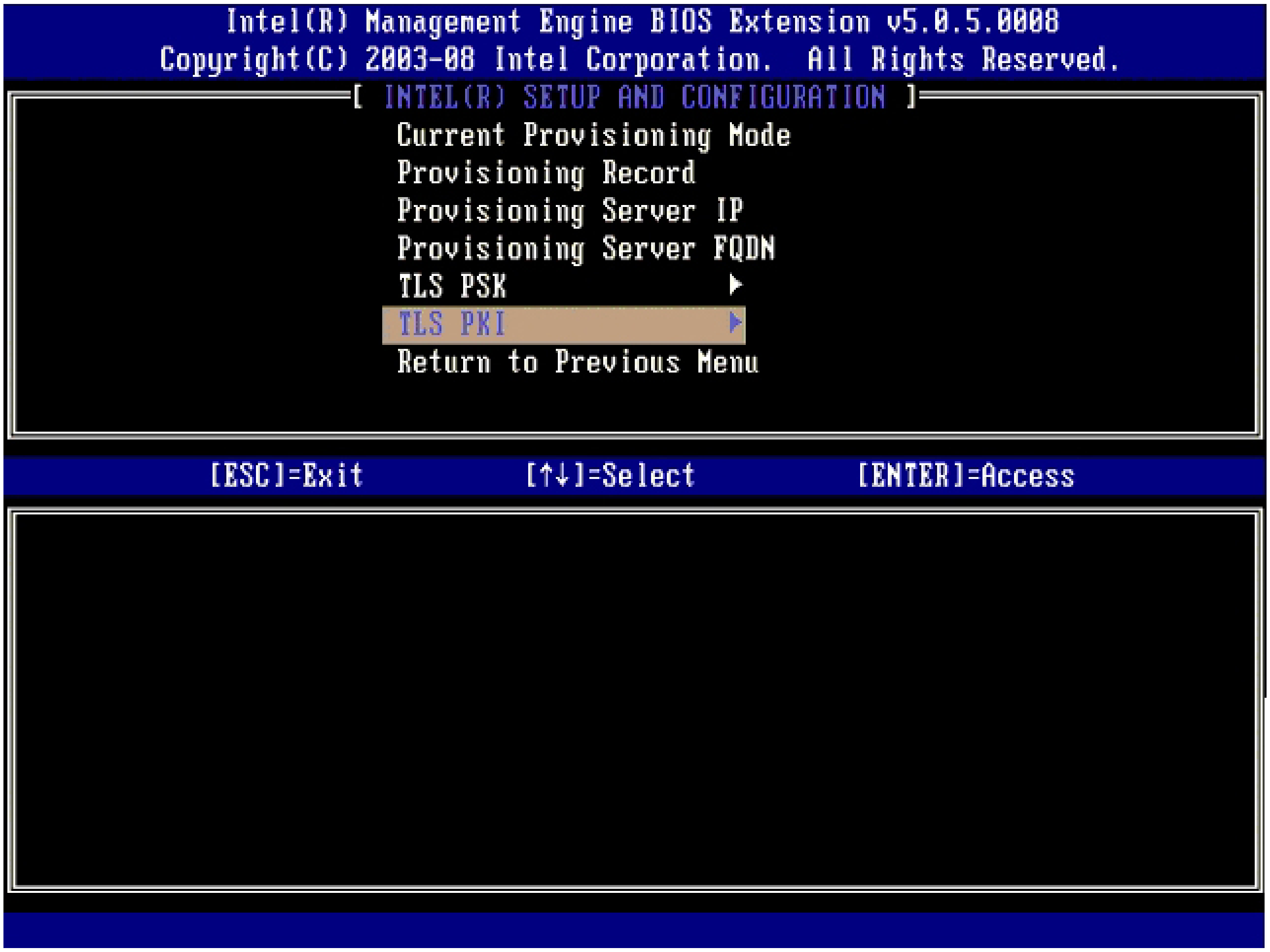


Skip the **Delete PID and PPS** option. This option returns the computer to factory defaults. See the "Return to Default" section for more information about unprovisioning.

21. Select **Return to Previous Menu**, and then press <Enter>.

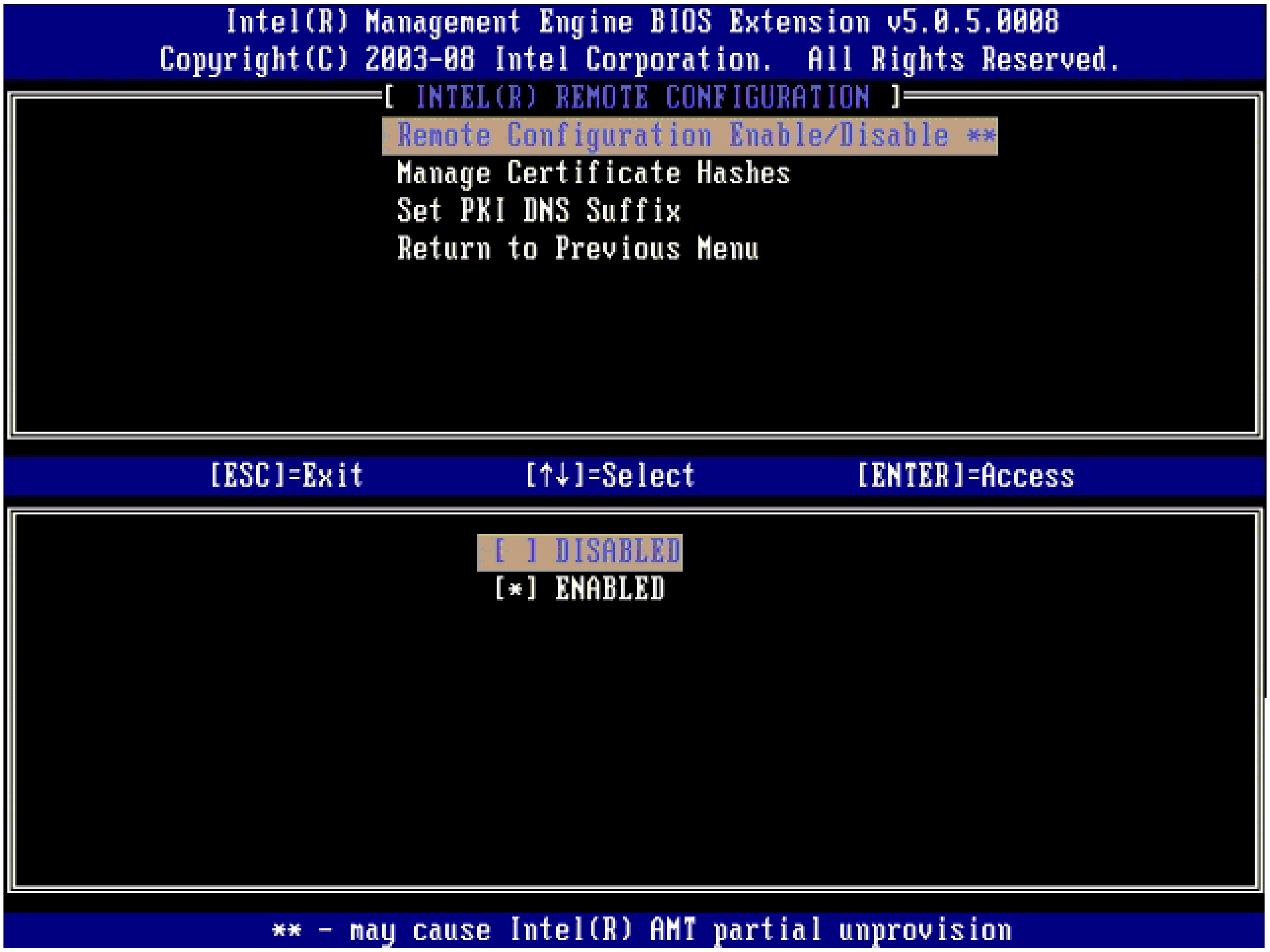


22. Select **TLS PKI** from the menu, and then press <Enter>.

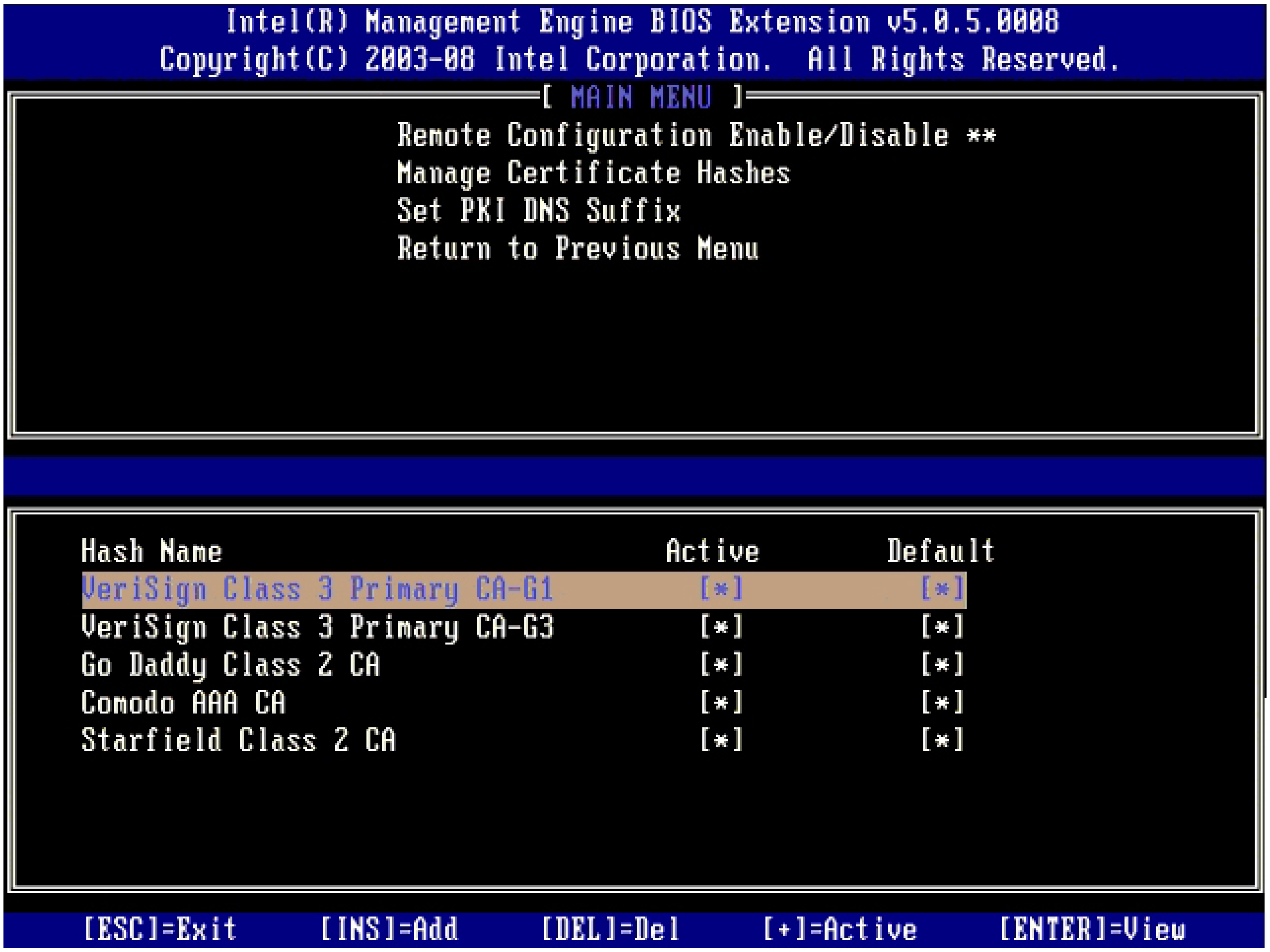


23. Select **Remote Configuration Enable / Disable** from the menu, and then press <Enter>.

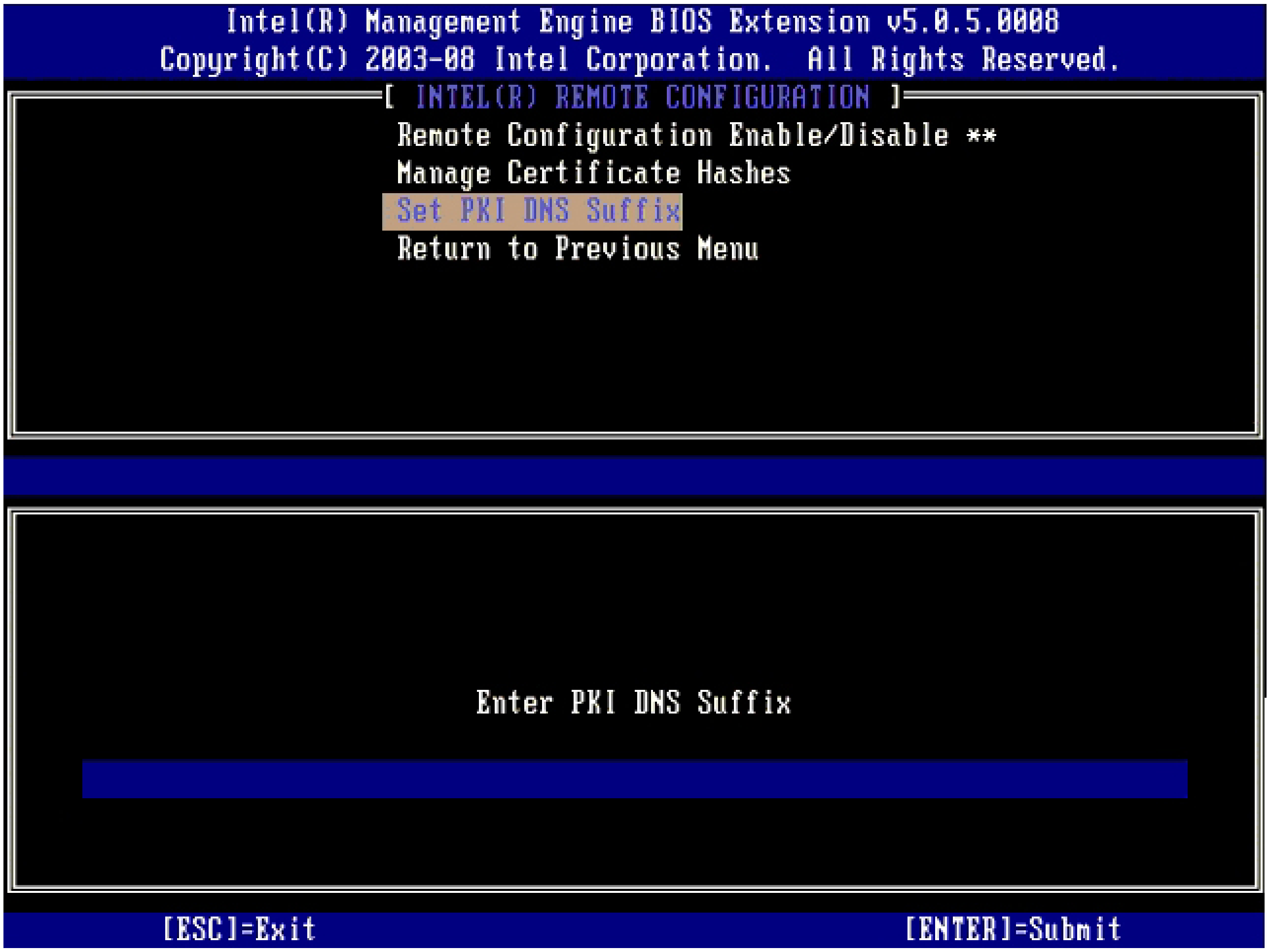
    This option is **Enabled** by default and can be **Disabled** if the network infrastructure does not support a Certificate Authority (CA).



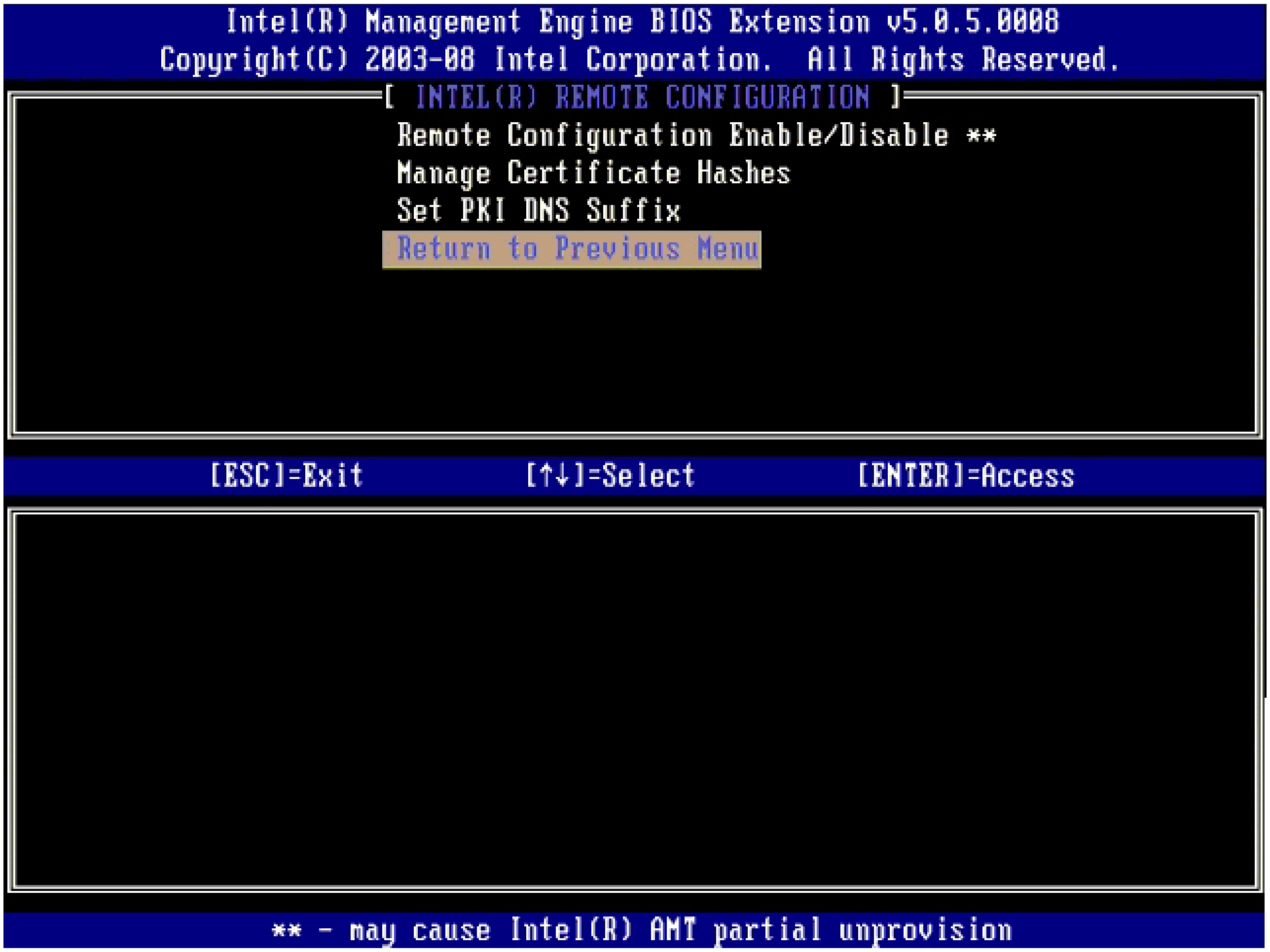
Manage Certificate Hashes option is the next option. Four hashes are configured by default. Hashes can be deleted or added per customer needs.



24. Select **Set PKI DNS Suffix** from the menu. Press <Enter>.
25. Type the PKI DNS Suffix in the text field and press <Enter>.



26. Select **Return to Previous Menu**, and press <Enter>.

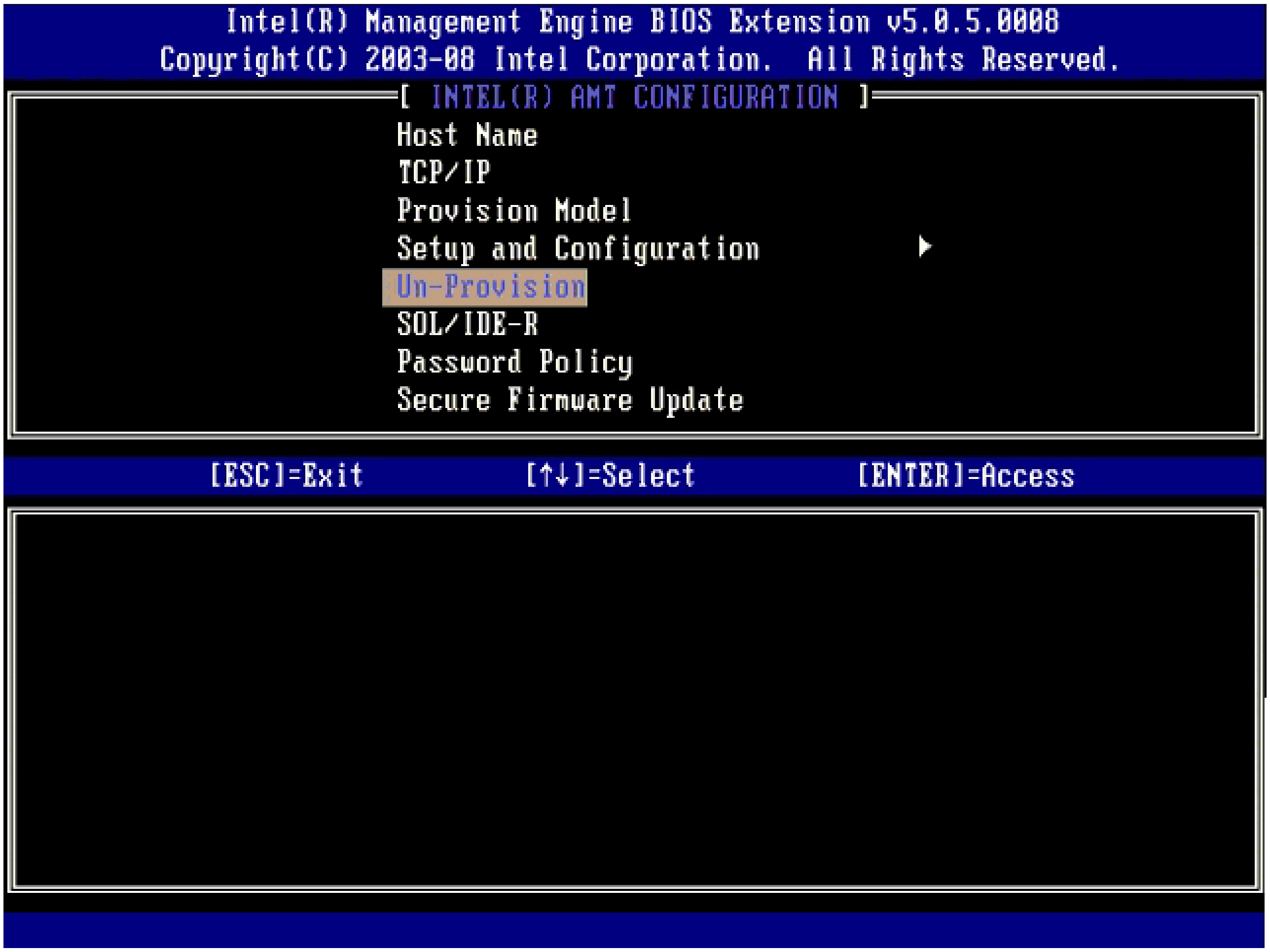


27. Select **Return to Previous Menu**, and then press <Enter>.

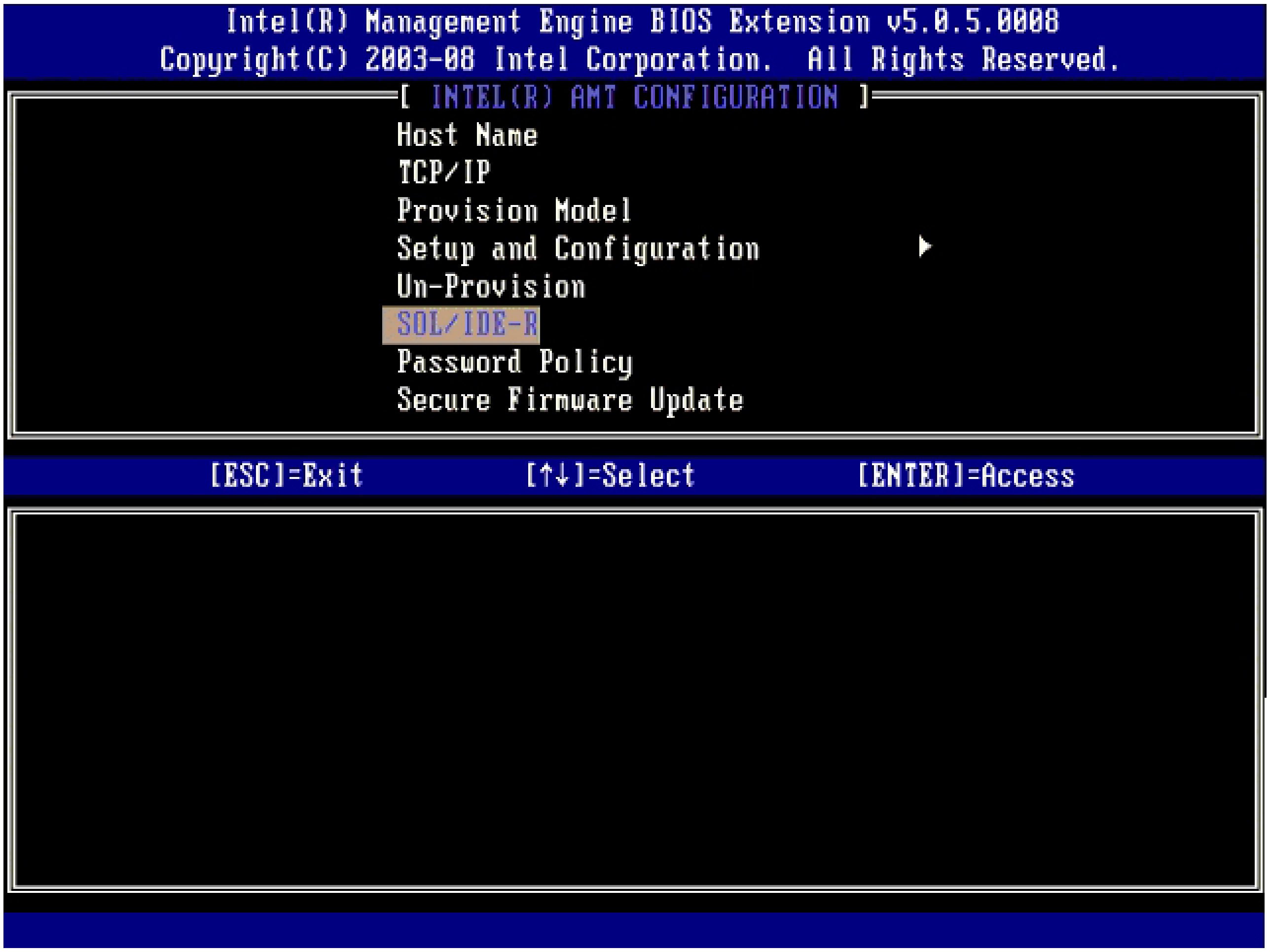
    This returns you to the **Intel AMT Configuration** menu.



Skip the **Un-Provision** option. This option returns the computer to factory defaults. See the "Return to Default" section for more information about unprovisioning.

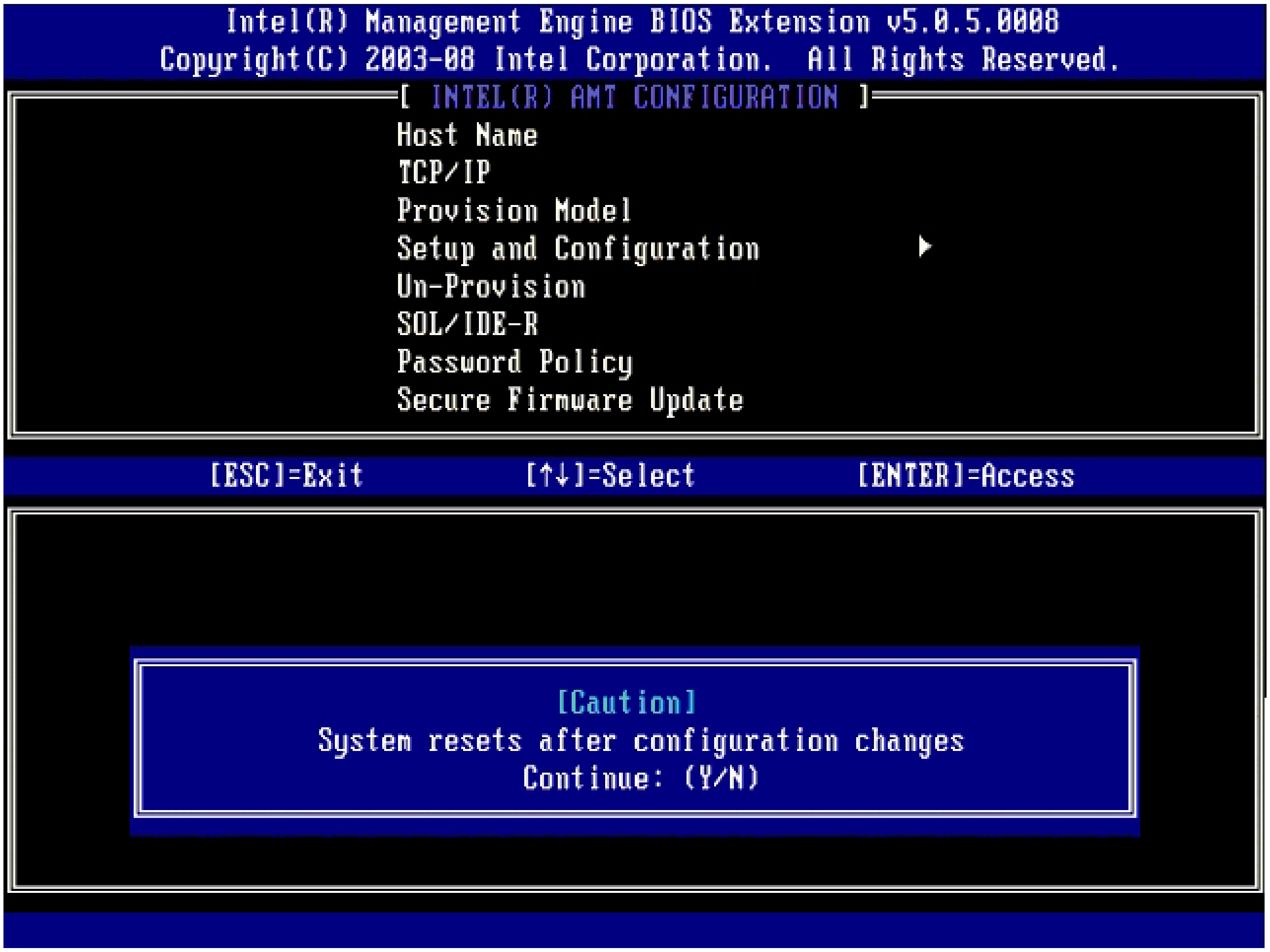


28. Select **SOL/IDE-R**, and then press <Enter>.



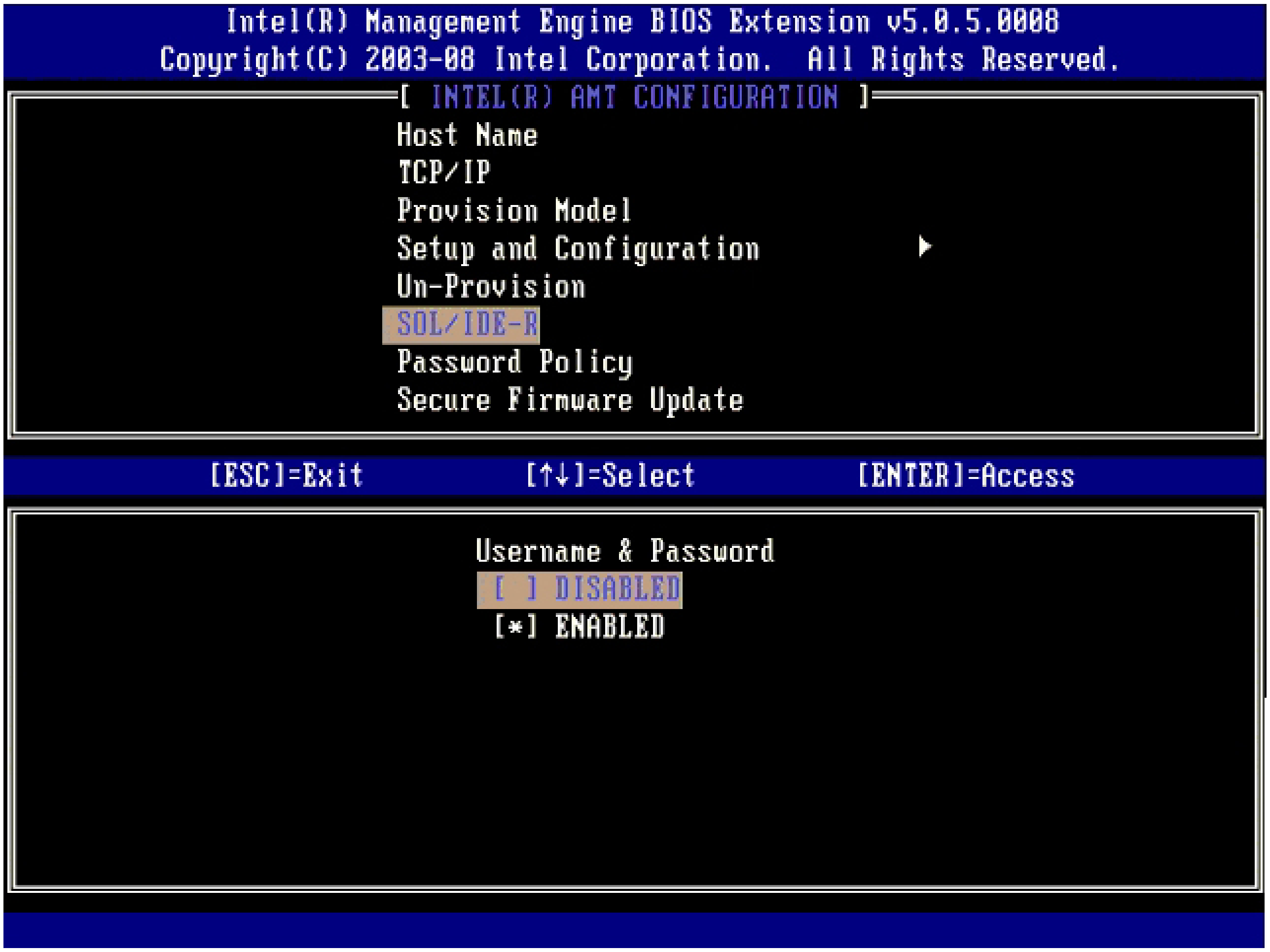
29. Press <y> when the following message appears:

    - [Caution] System resets after configuration changes. Continue: (Y/N)

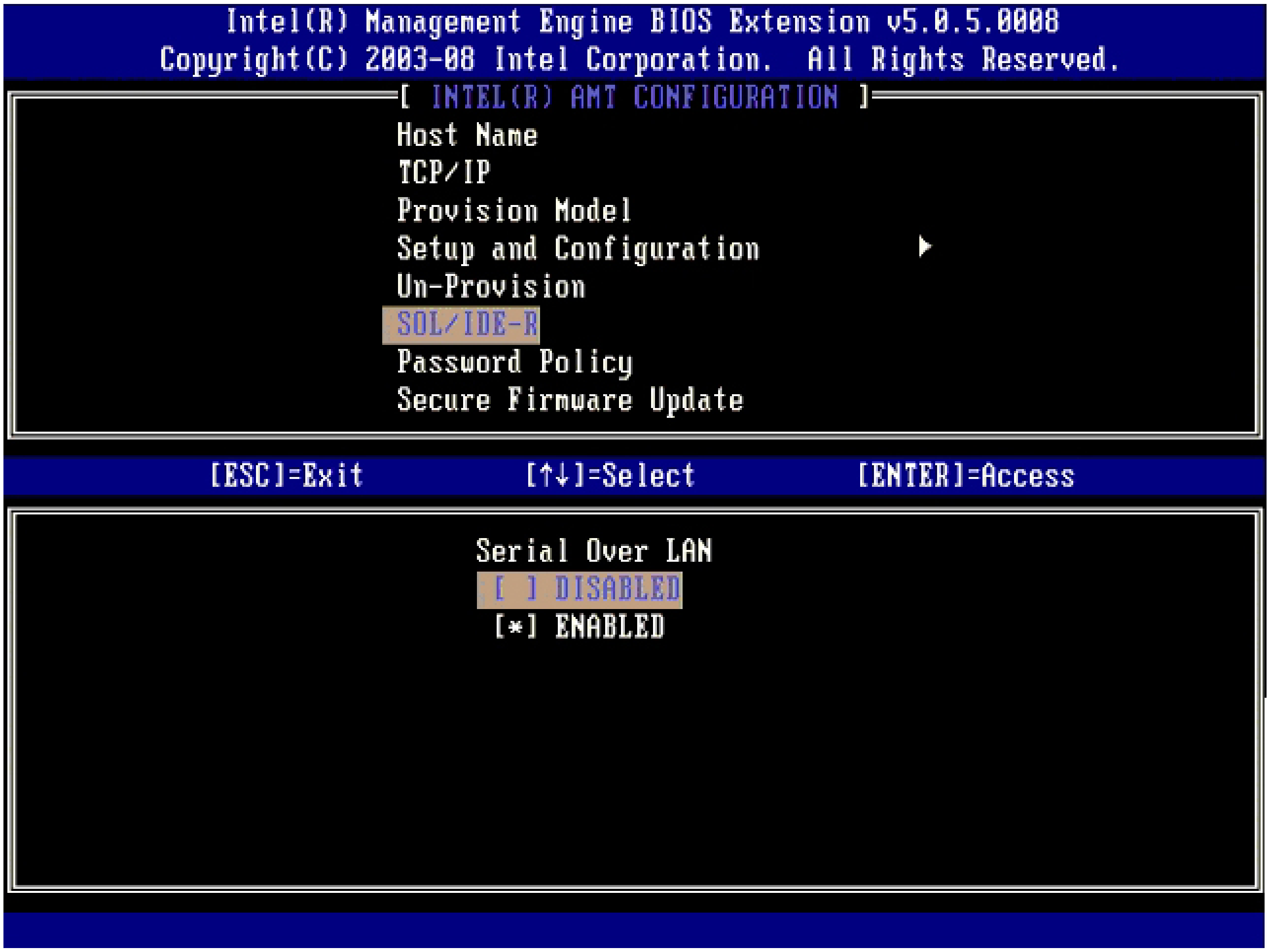


For **User Name & Password**, select **Enabled** and then press <Enter>.

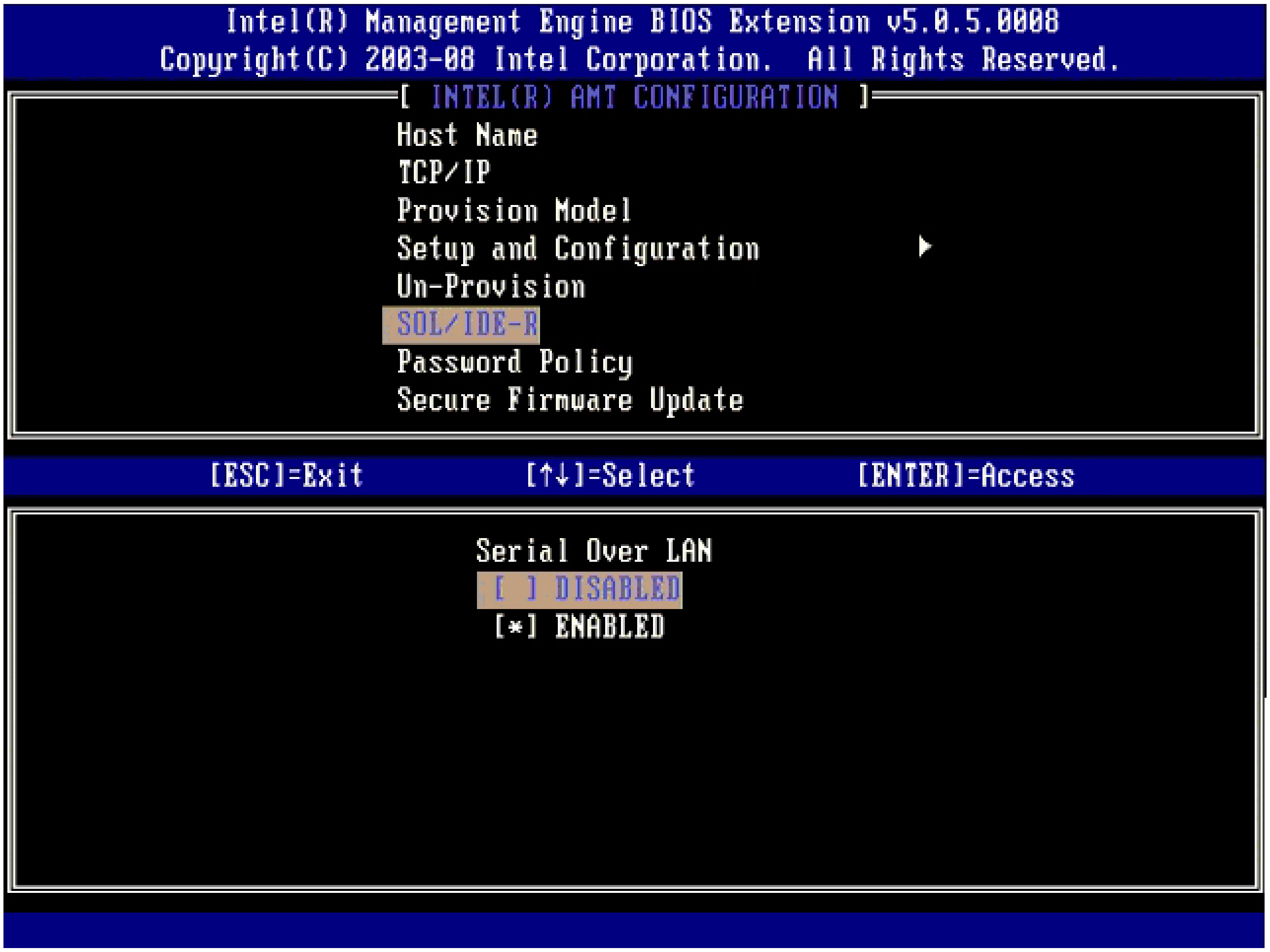
This option allows you to add users and passwords from the WebGUI. If the option is disabled, then only the administrator has MEBx remote access.



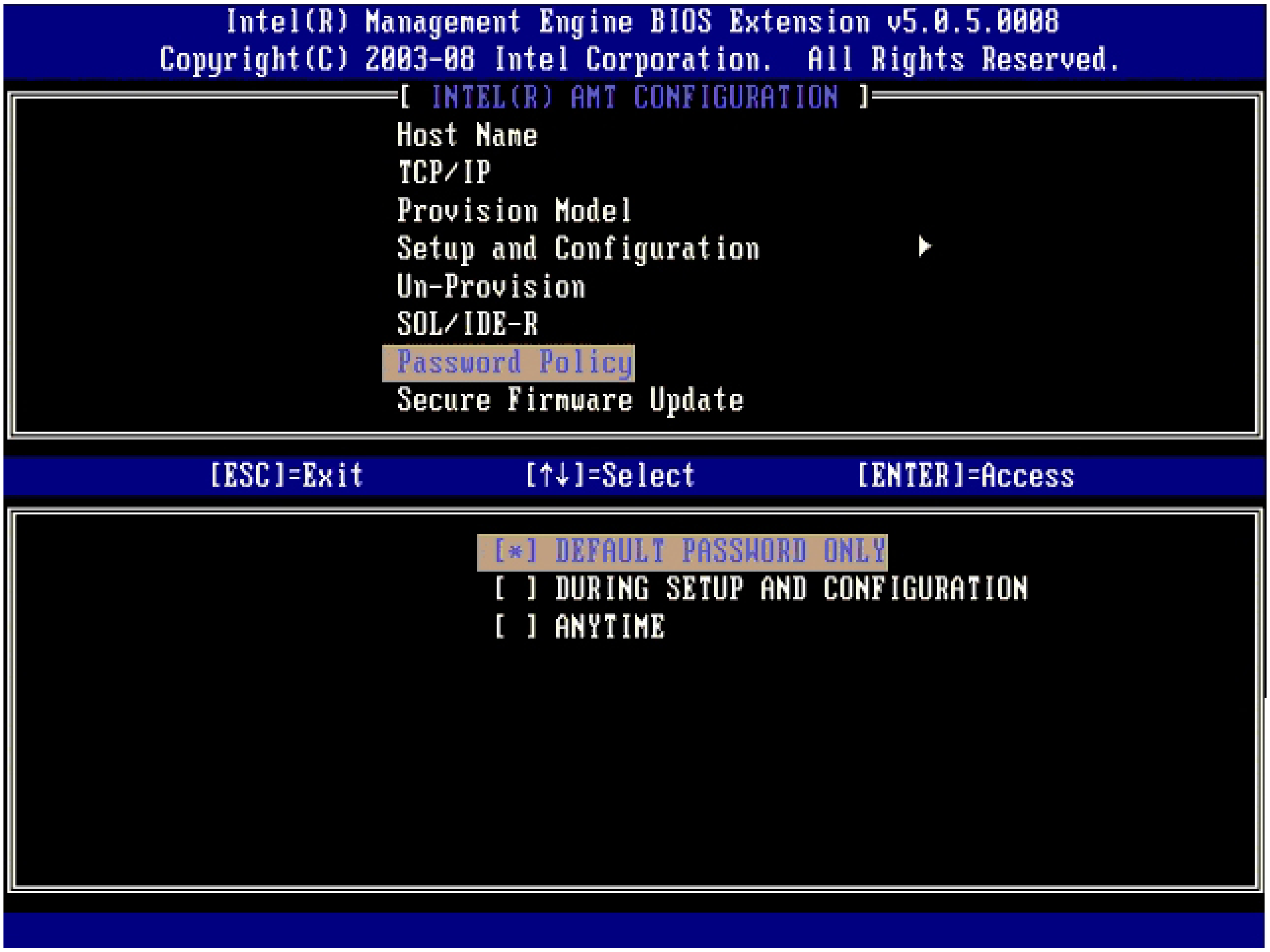
For **Serial Over LAN** (SOL/IDE-R), select **Enabled** and then press <Enter>.



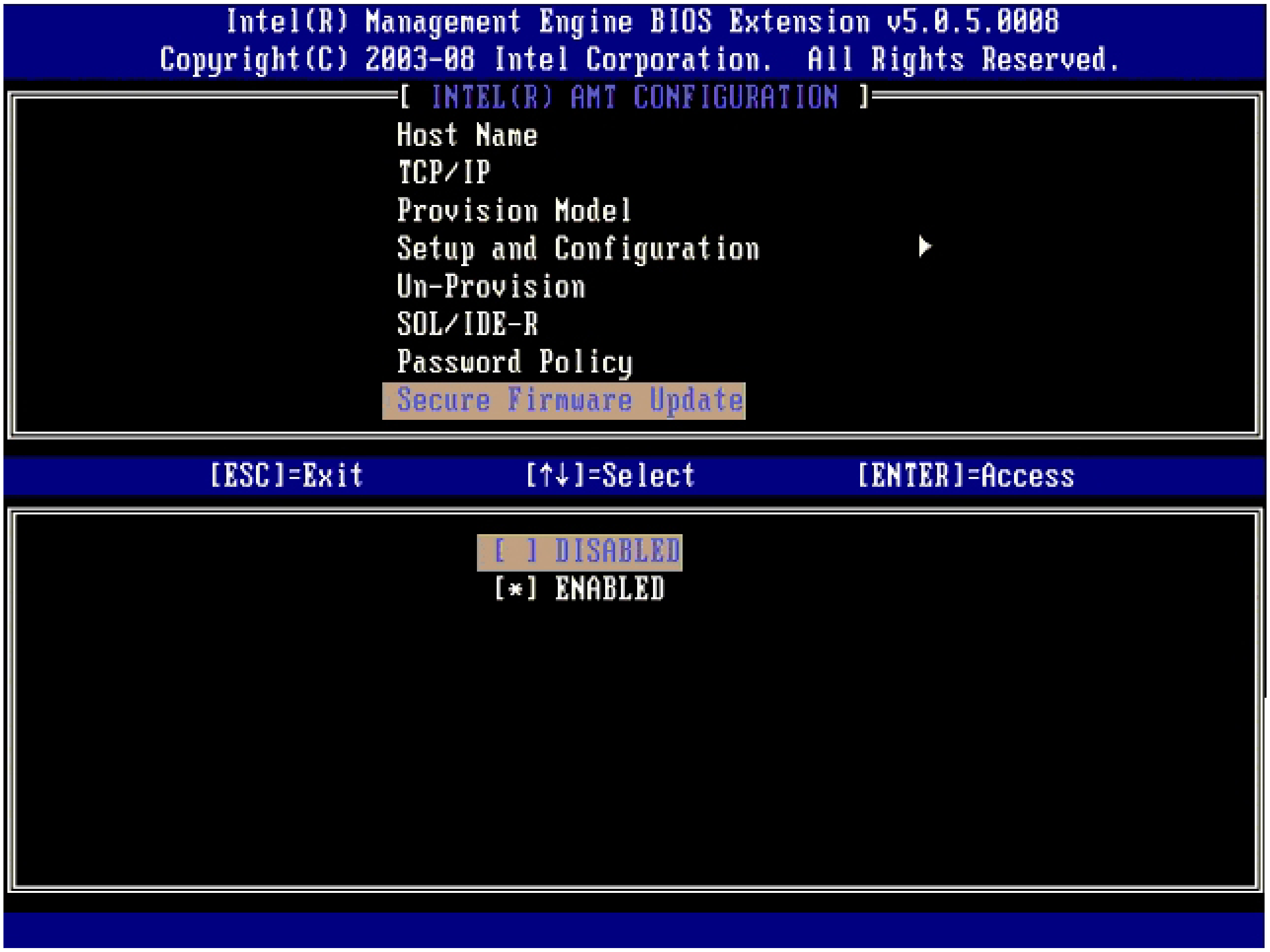
For **IDE Redirection**, select **Enabled** and then press <Enter>.



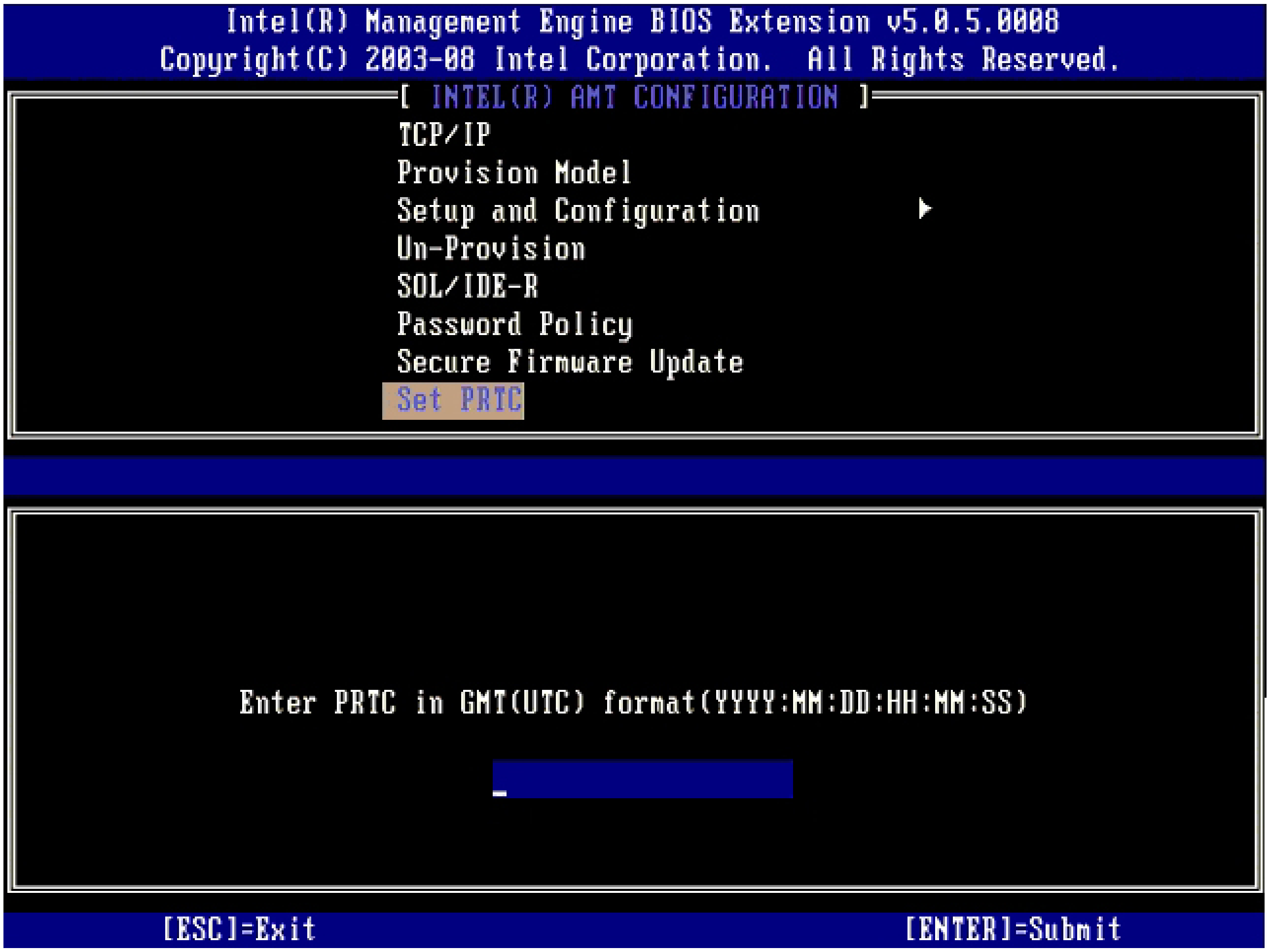
Password Policy is the next option. The default setting is **Default Password Only**.



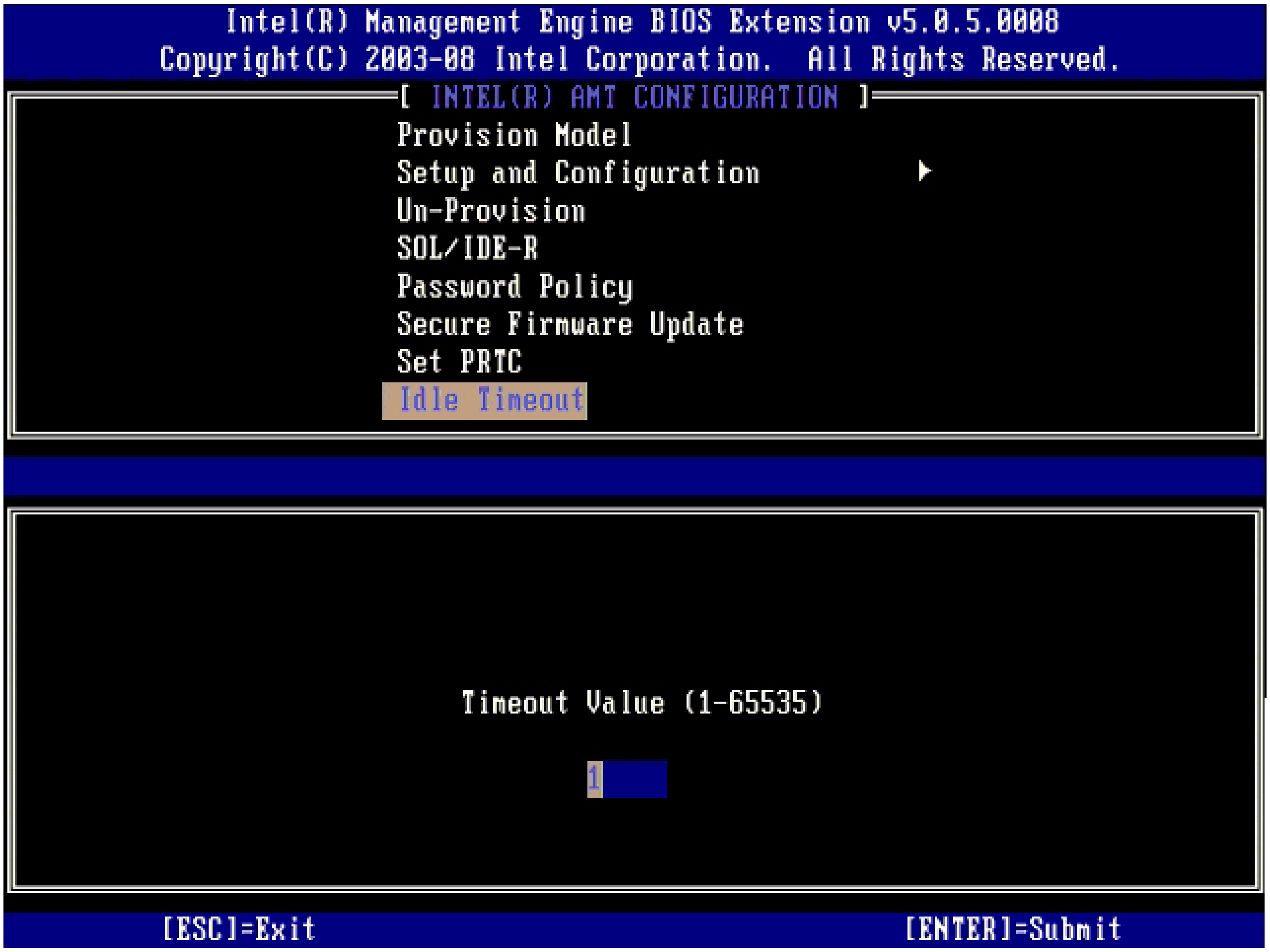
Secure Firmware Update is the next option. The default setting is **Enabled**.



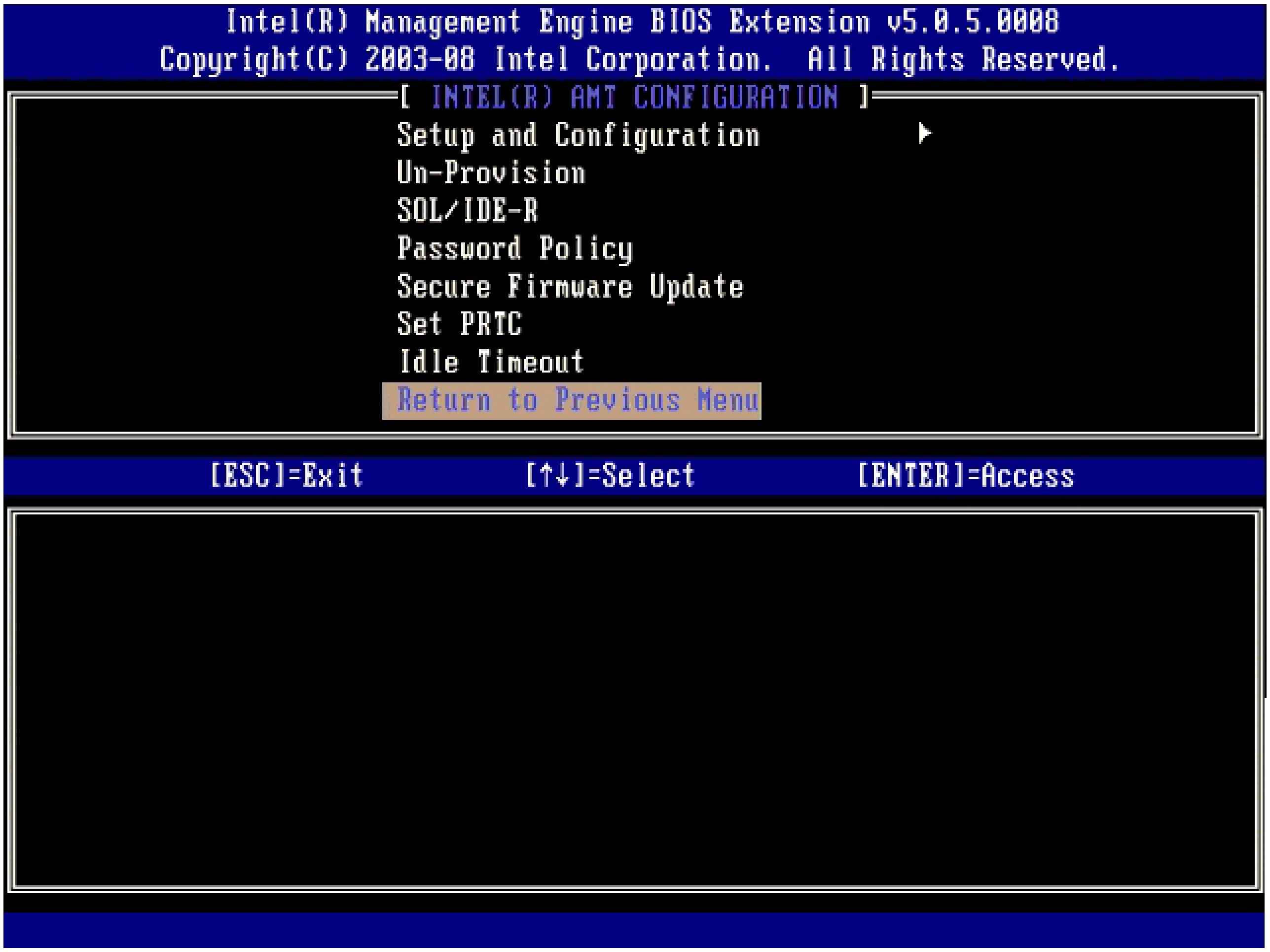
Skip **Set PRTC**.



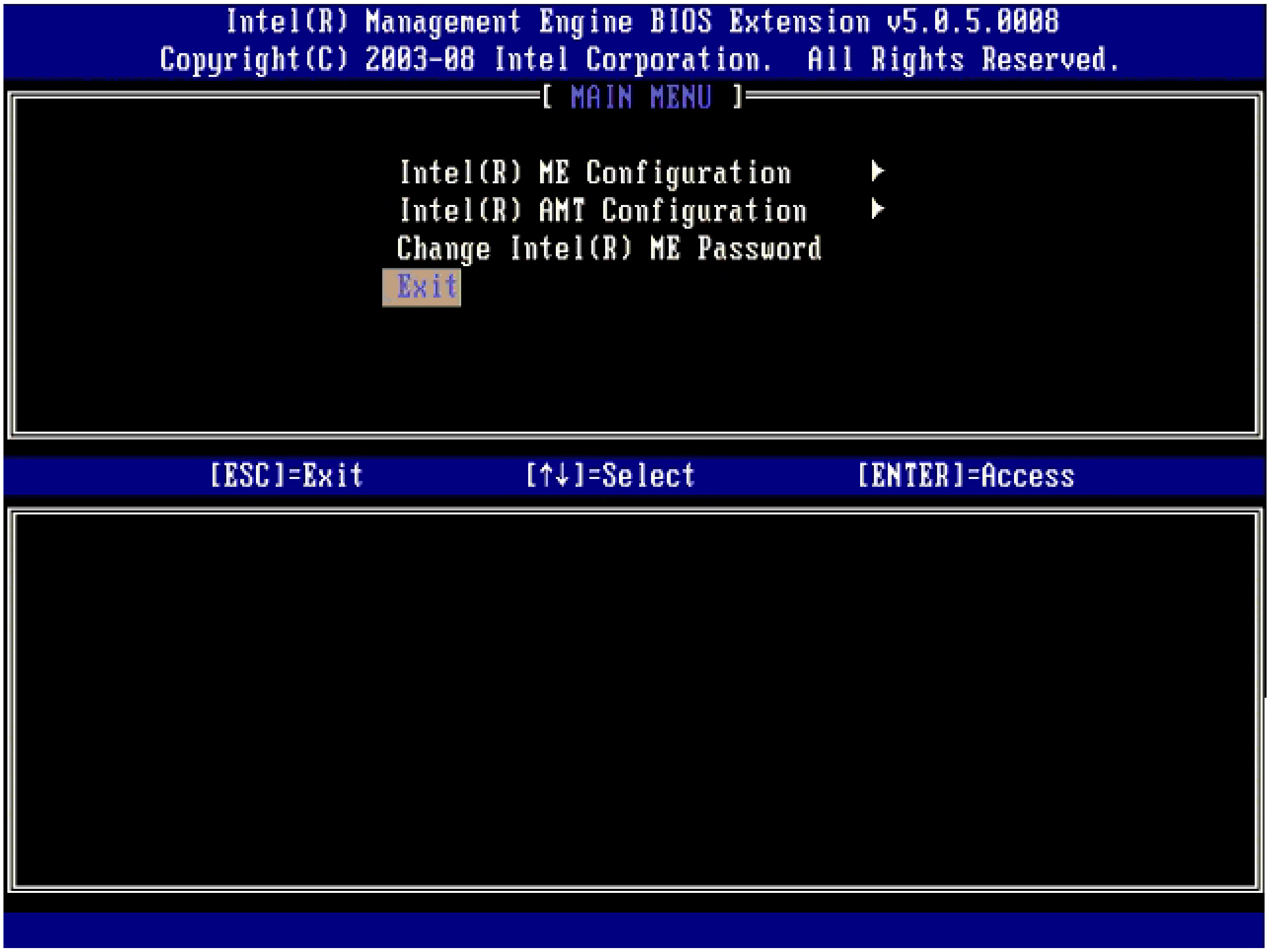
Idle Timeout is the next option. The default setting is **1**. This timeout is applicable only when a WoL option is selected for enabling ME for the Enterprise operating mode.



30. Select **Return to Previous Menu**, and then press <Enter>.

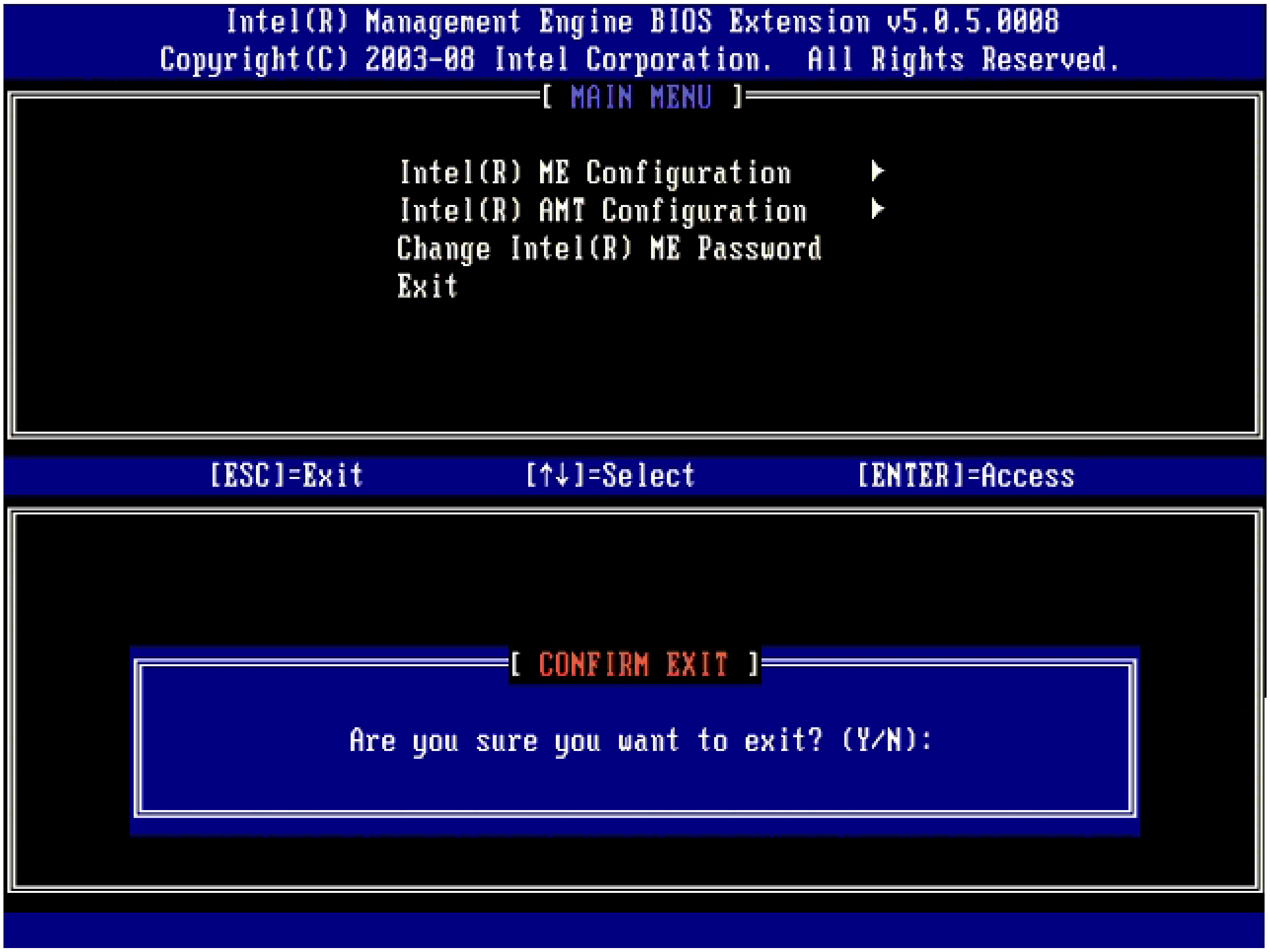


31. Select **Exit**, and then press <Enter>.



32. Press <y> when the following message appears:

    Are you sure you want to exit? (Y/N):



The computer restarts.

33. Turn off the computer and disconnect the power cable. The computer is now in setup state and is ready for deployment.

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MEBx Interface--SMB Mode

The Intel® Management Engine BIOS Extension (MEBx) is an optional ROM module that Intel provides to Dell™ to be included in the Dell BIOS. The MEBx has been customized for Dell computers.

Dell also supports setup and configuration of Intel AMT in the small and medium business (SMB) mode. The only setting not required in the SMB mode is the **Set PID and PPS** option. Also, the **Provision Model** option is set to **Small Business** instead of **Enterprise**.

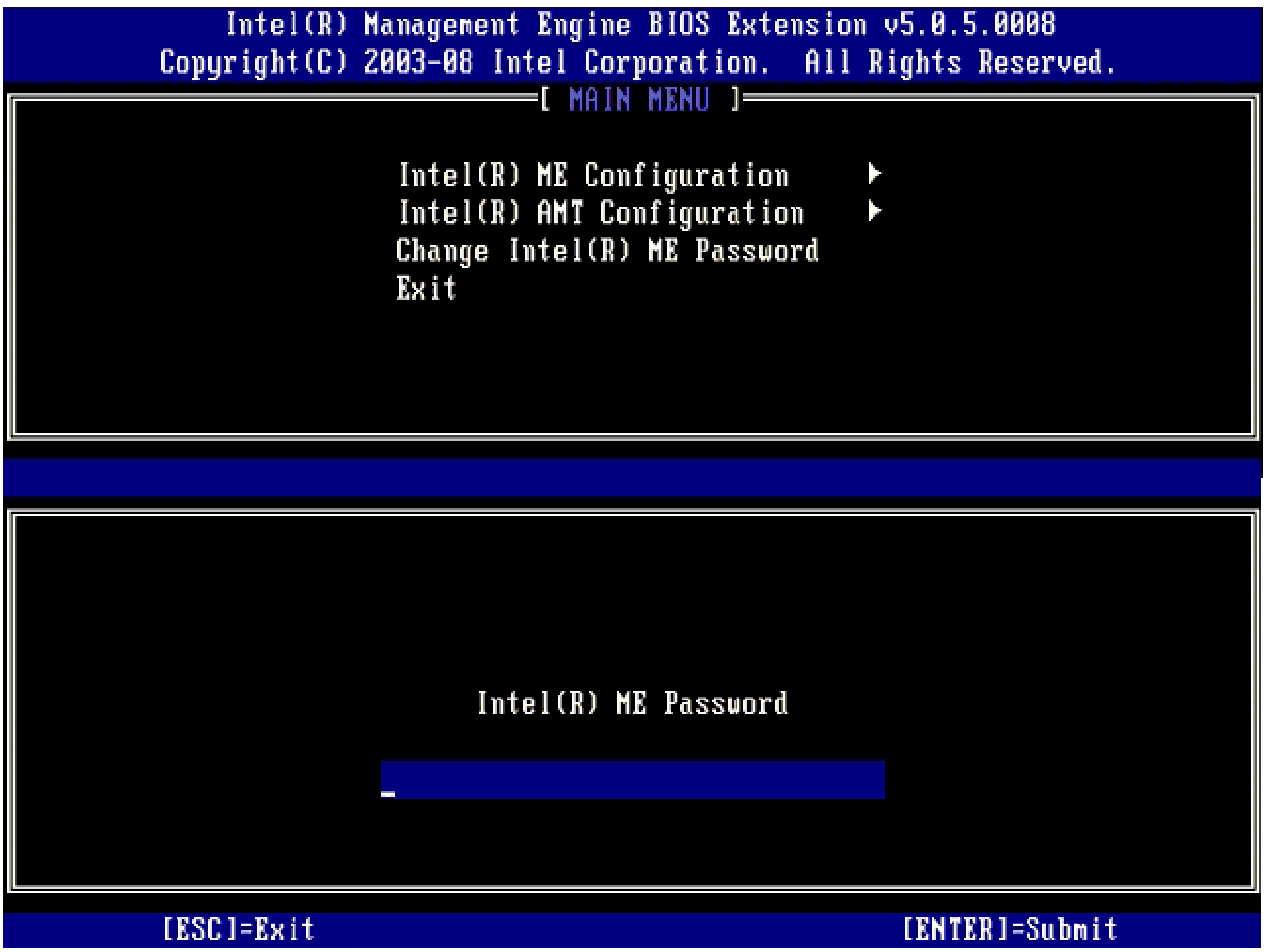
Follow the steps below to set up and configure Intel AMT in the SMB mode.

ME Configuration

To enable Intel Management Engine (ME) on the target platform, perform the following steps:

1. Press <Ctrl><p> at the Dell logo screen to enter the MEBx screens.
2. Type admin in the **Intel ME Password** field. Press <Enter>. Passwords are case sensitive.

   You must change the default password before making changes to the MEBx options.



3. Select **Change Intel ME Password**, and then press <Enter>.
4. Type the new password twice for verification.

   The new password must include the following elements:

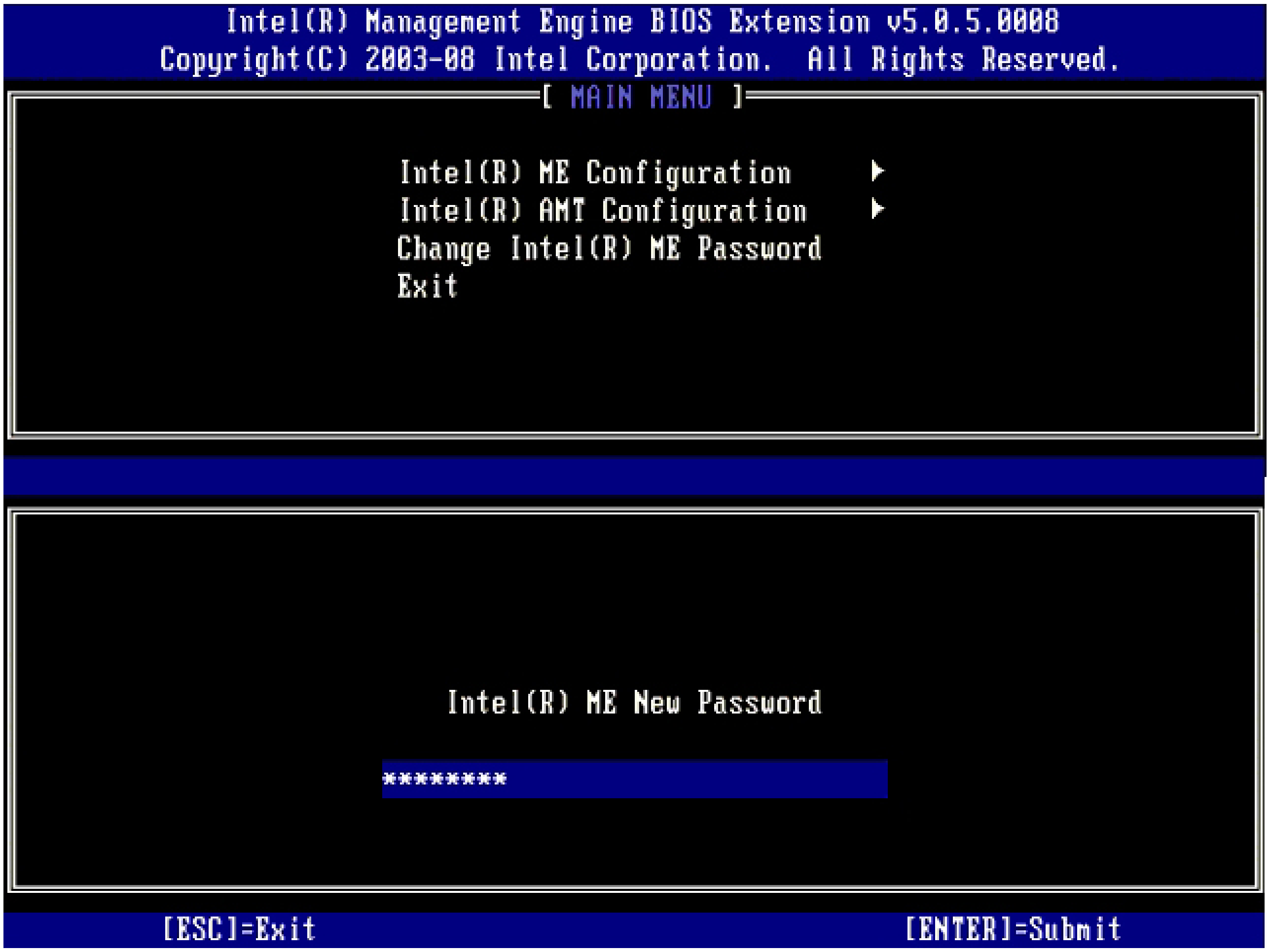
   - Eight characters
   - One uppercase letter
   - One lowercase letter

- A number
- A special (nonalphanumeric) character, such as !, $, or ; excluding the :, ", and , characters.)

The underscore (_) and spacebar are valid password characters but do NOT add to the password complexity.

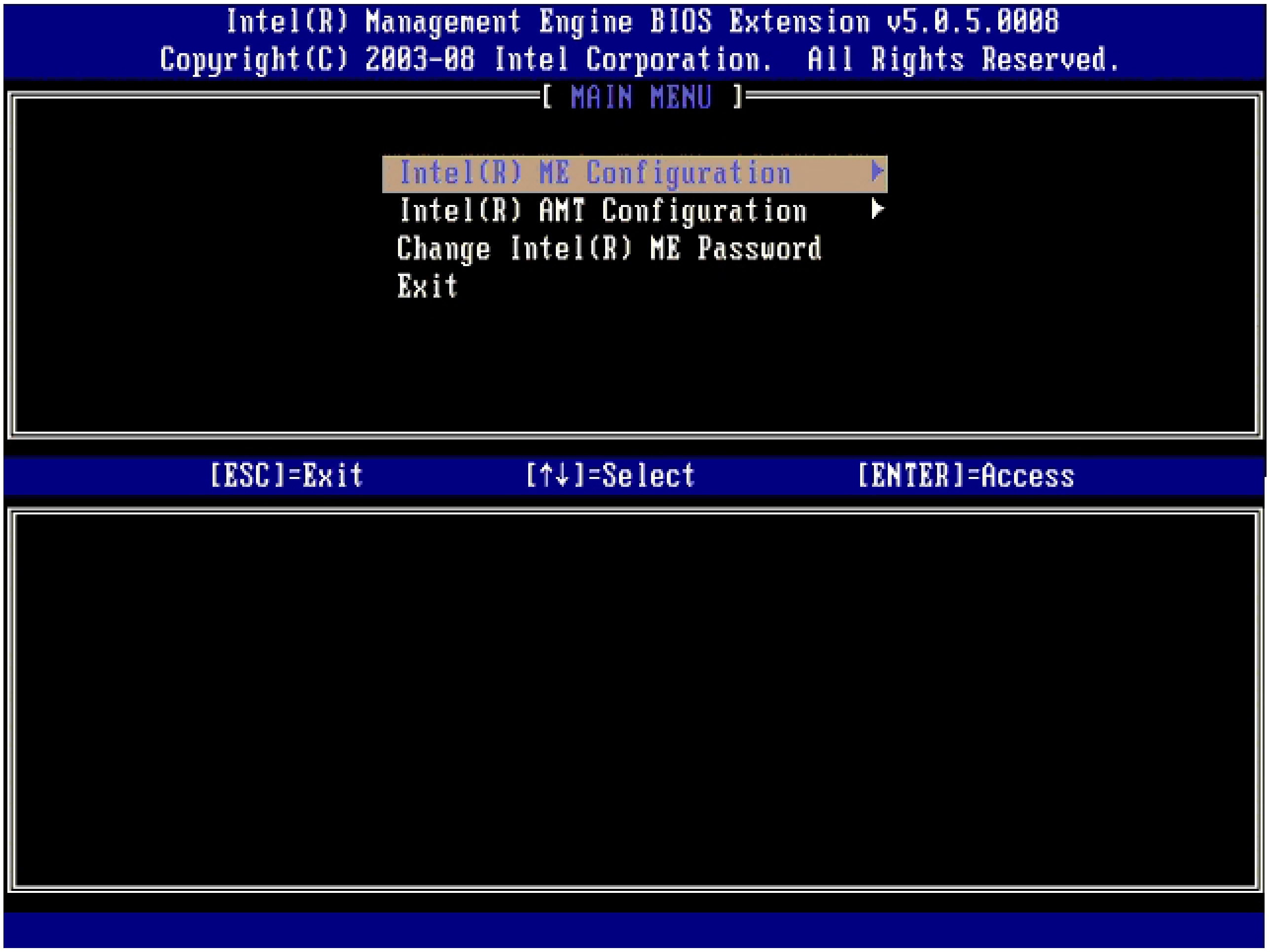
5. Change the password to establish Intel AMT ownership.

   The computer then goes from the factory-default state to the setup state.



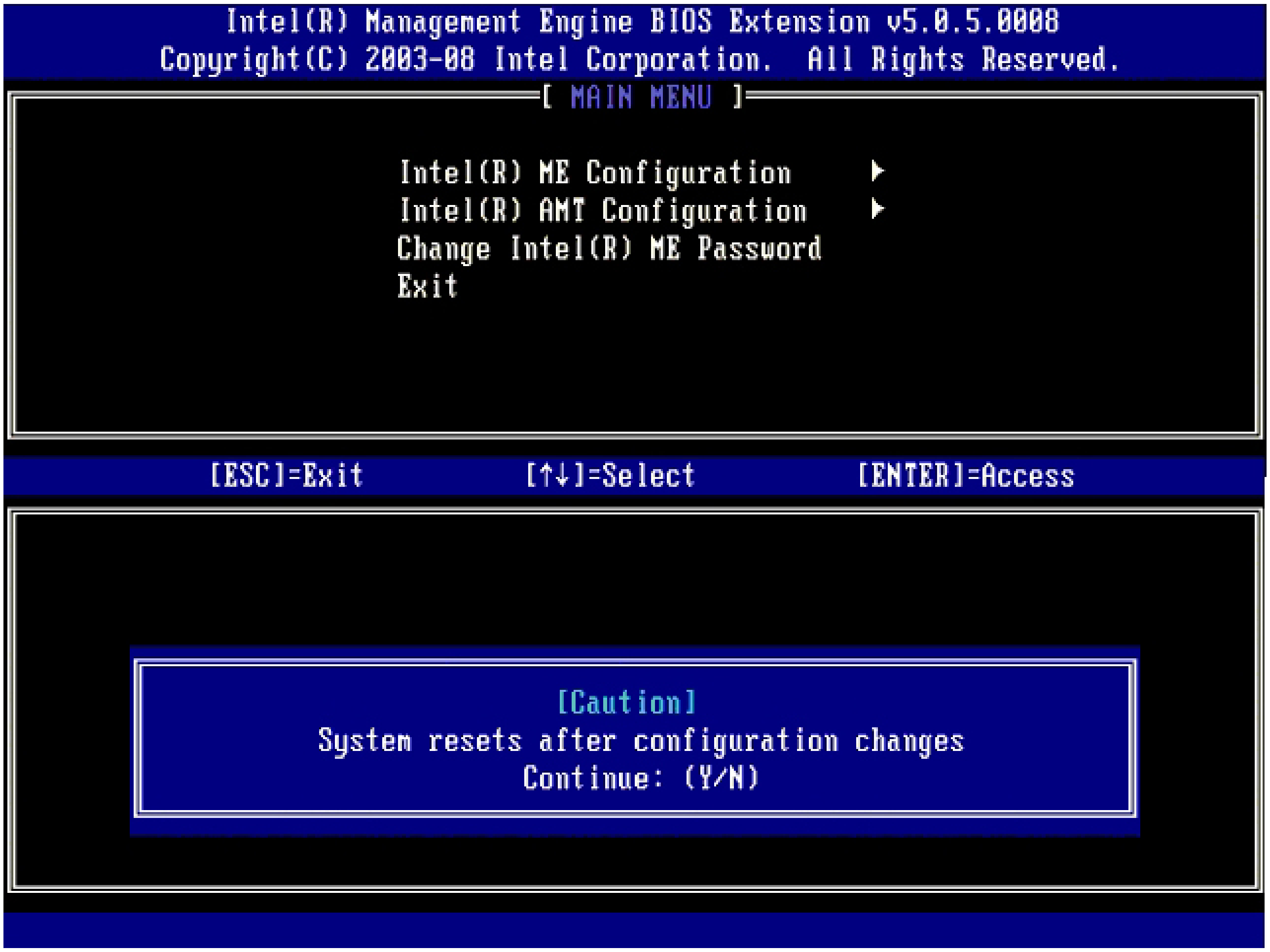
6. Select **Intel ME Configuration**, and then press <Enter>.

   ME Platform Configuration allows you to configure ME features such as power options, firmware update capabilities, and so on.



7. Press <y> when the following message appears:

   `System resets after configuration change. Continue (Y/N).`

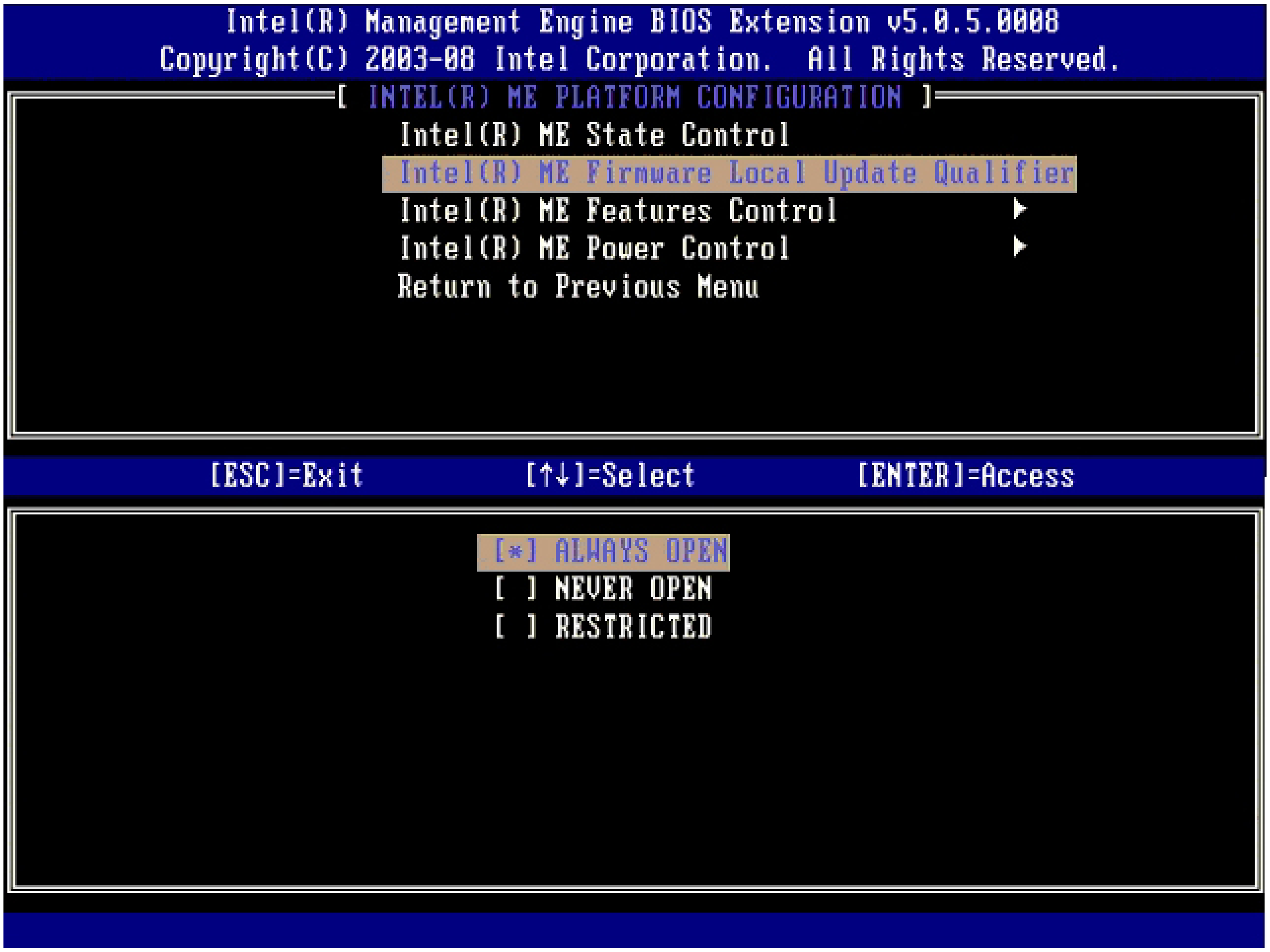


Intel ME State Control is the next option. The default setting for this option is **Enabled**. Do not change this setting to **Disabled**. If you want to disable Intel AMT, change the **Manageability Feature Selection** option to **None** later in this procedure.

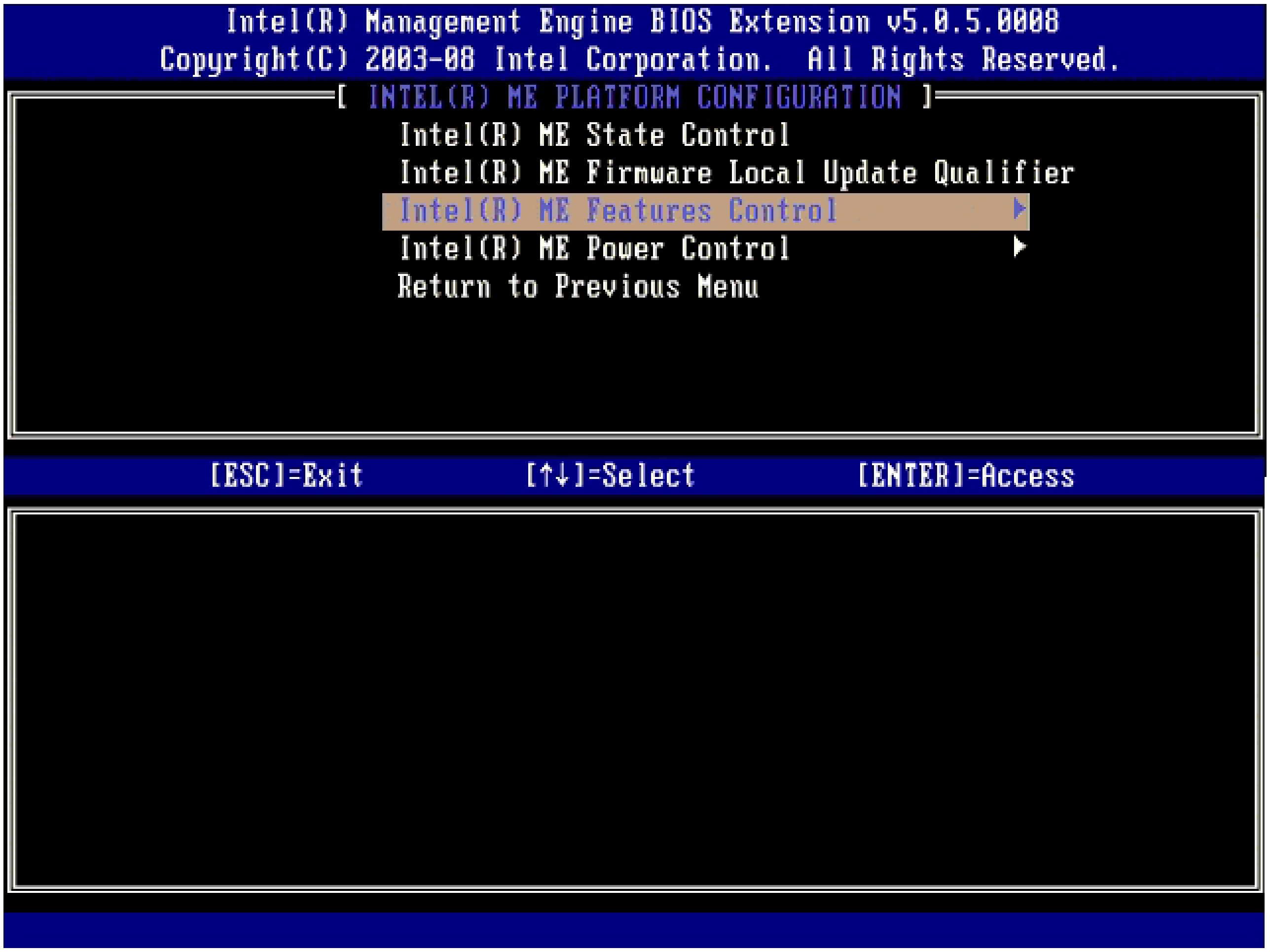


8. Select **Intel ME Firmware Local Update** and then press <Enter>.
9. Select either **Always Open, Never Open, or Restricted,** and then press <Enter>.

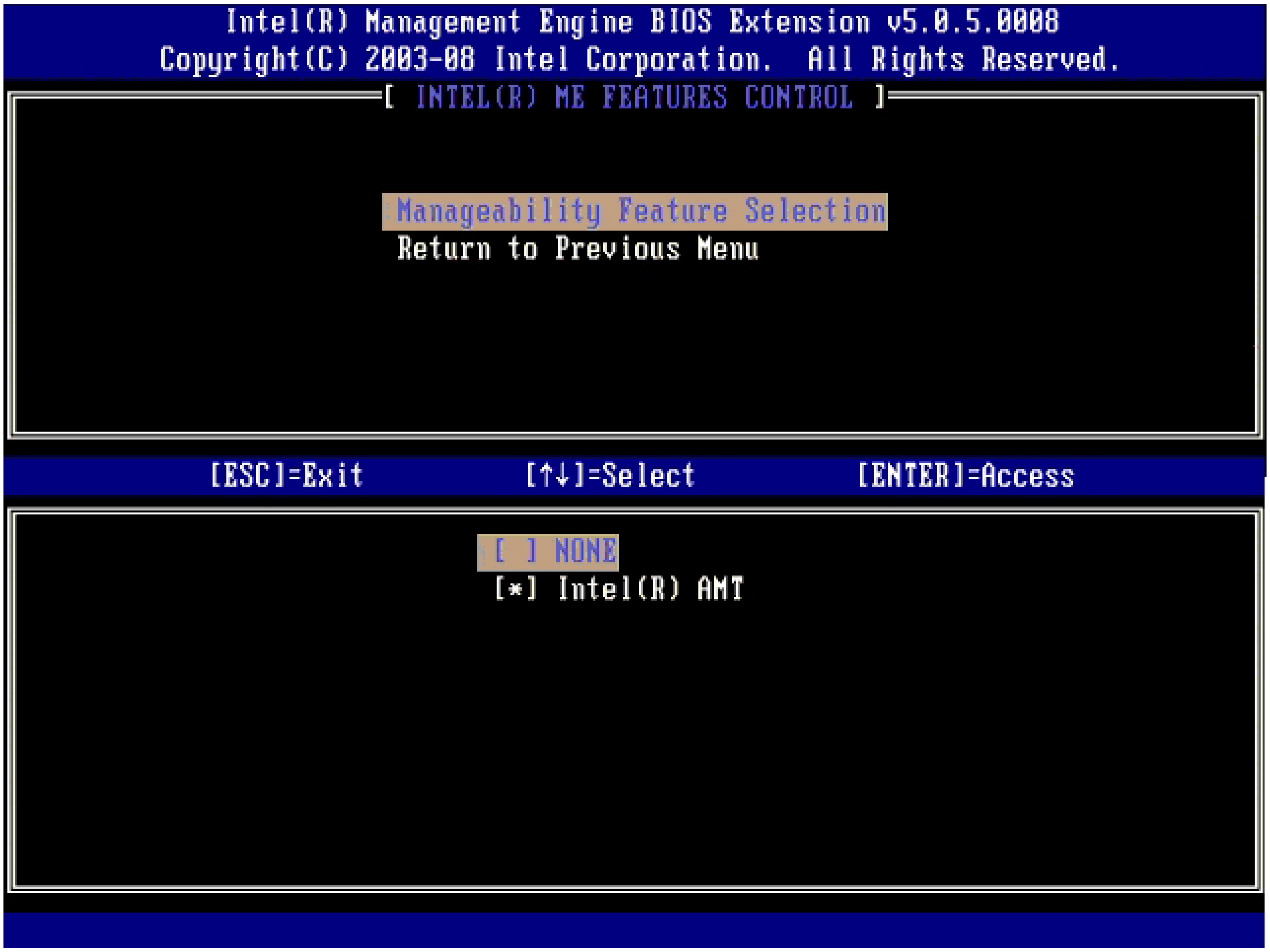
   The default setting for this option is **Disabled**.



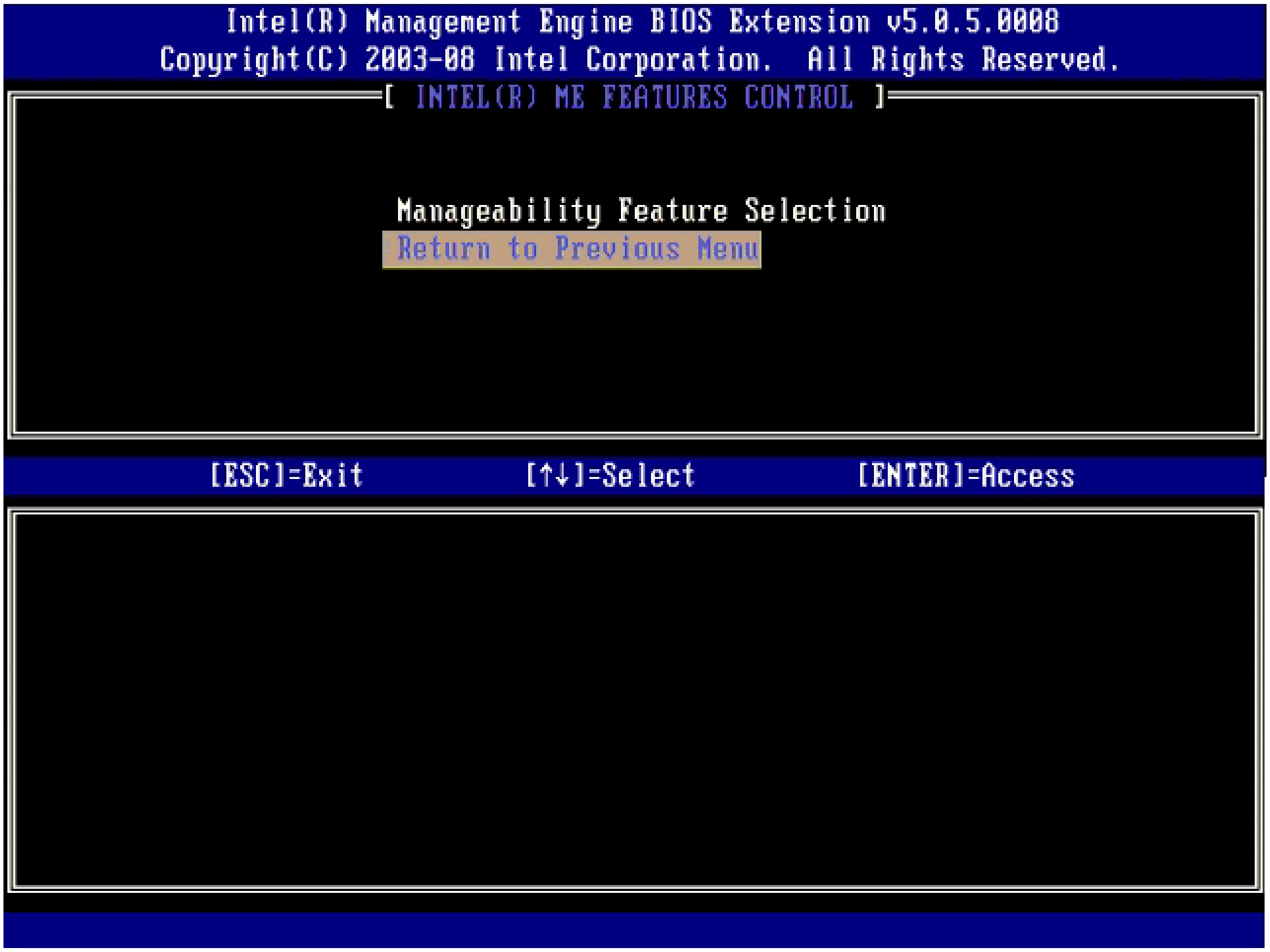
10. Select **Intel ME Features Control**, and then press <Enter>.



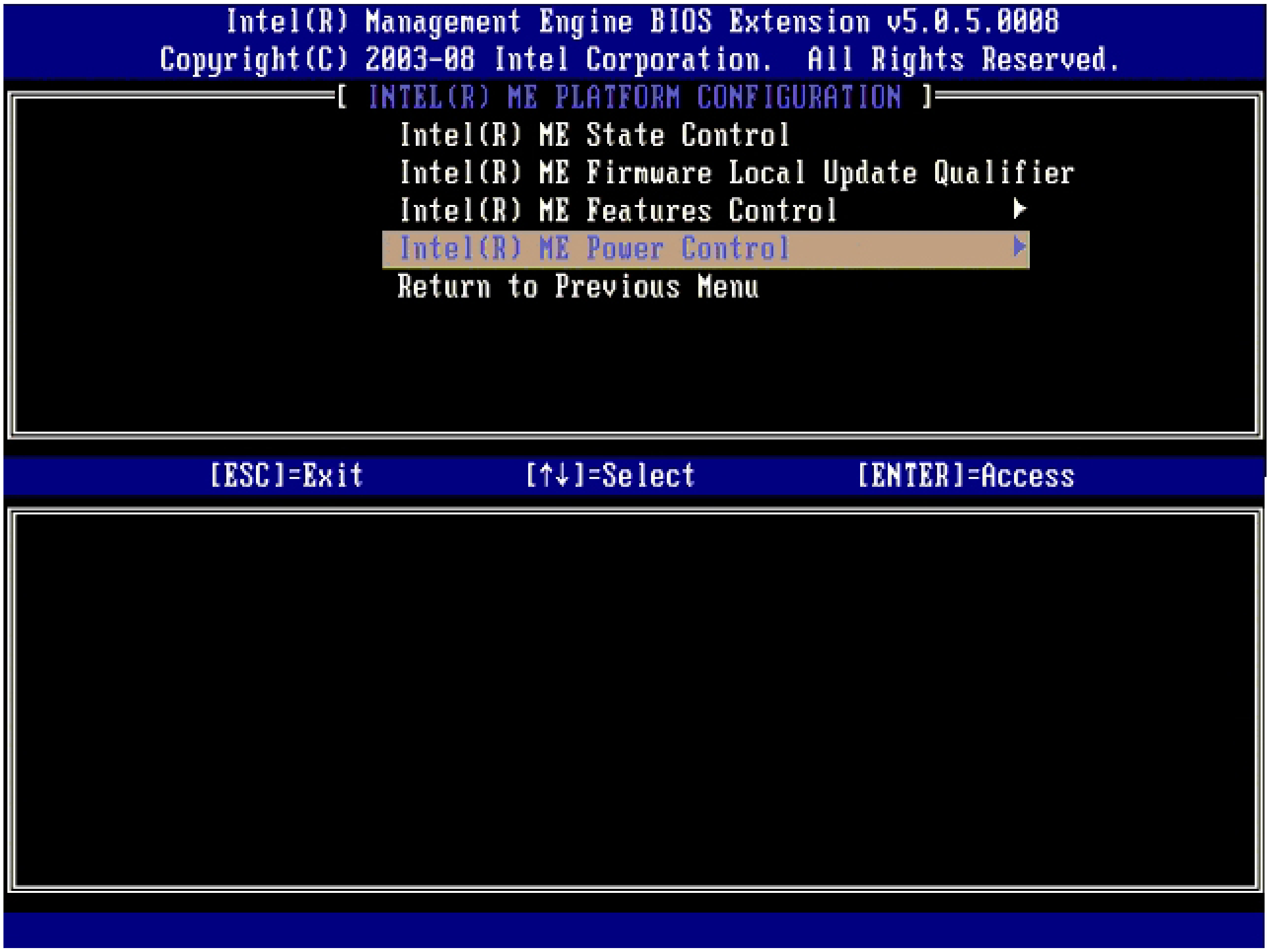
Manageability Feature Selection is the next option. This feature sets the platform management mode. The default setting is **Intel AMT**. Selecting the **None** option disables all remote management capabilities.



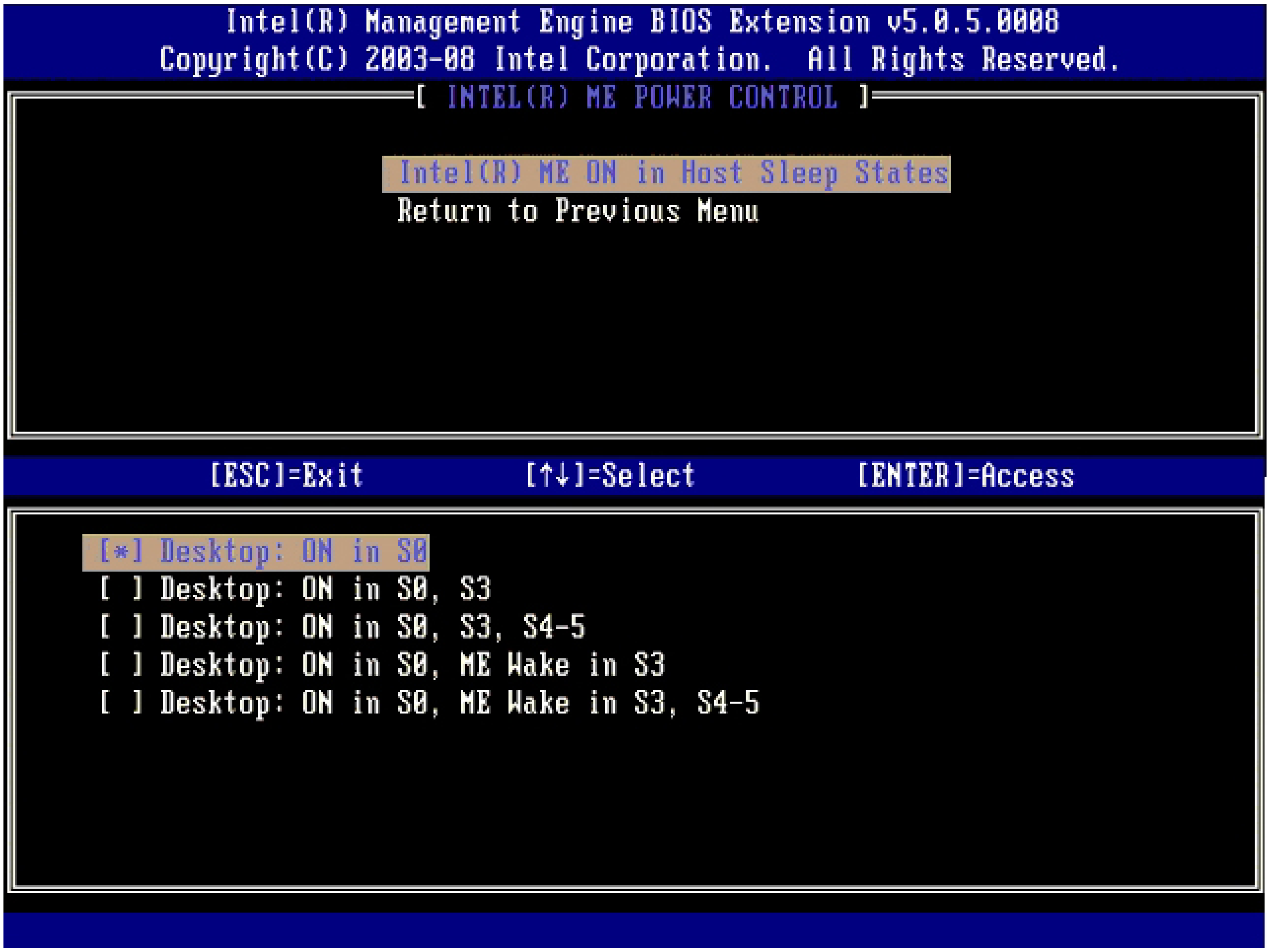
11. Select **Return to Previous Menu**, and then press <Enter>.



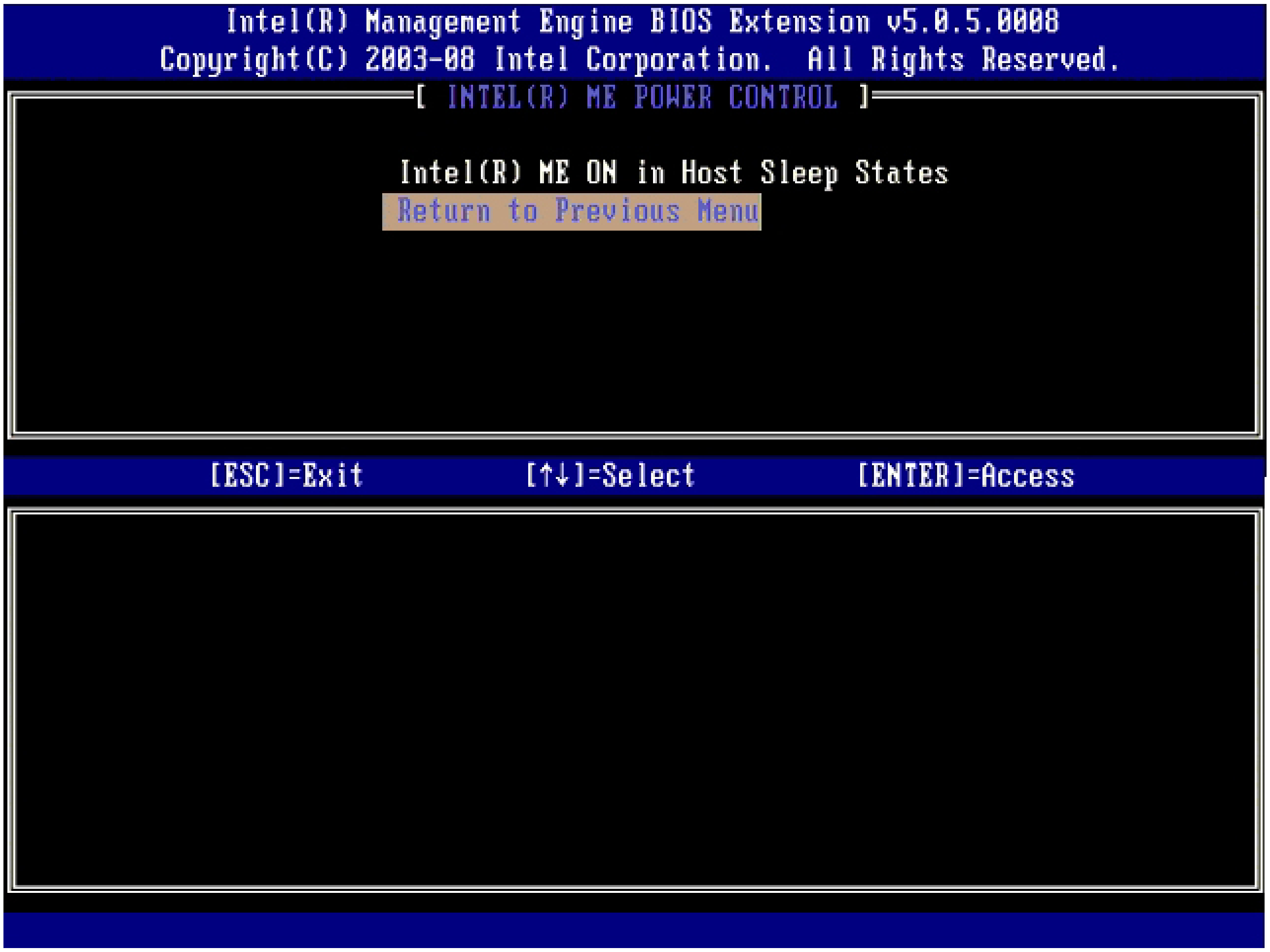
12. Select **Intel ME Power Control**, and then press <Enter>.



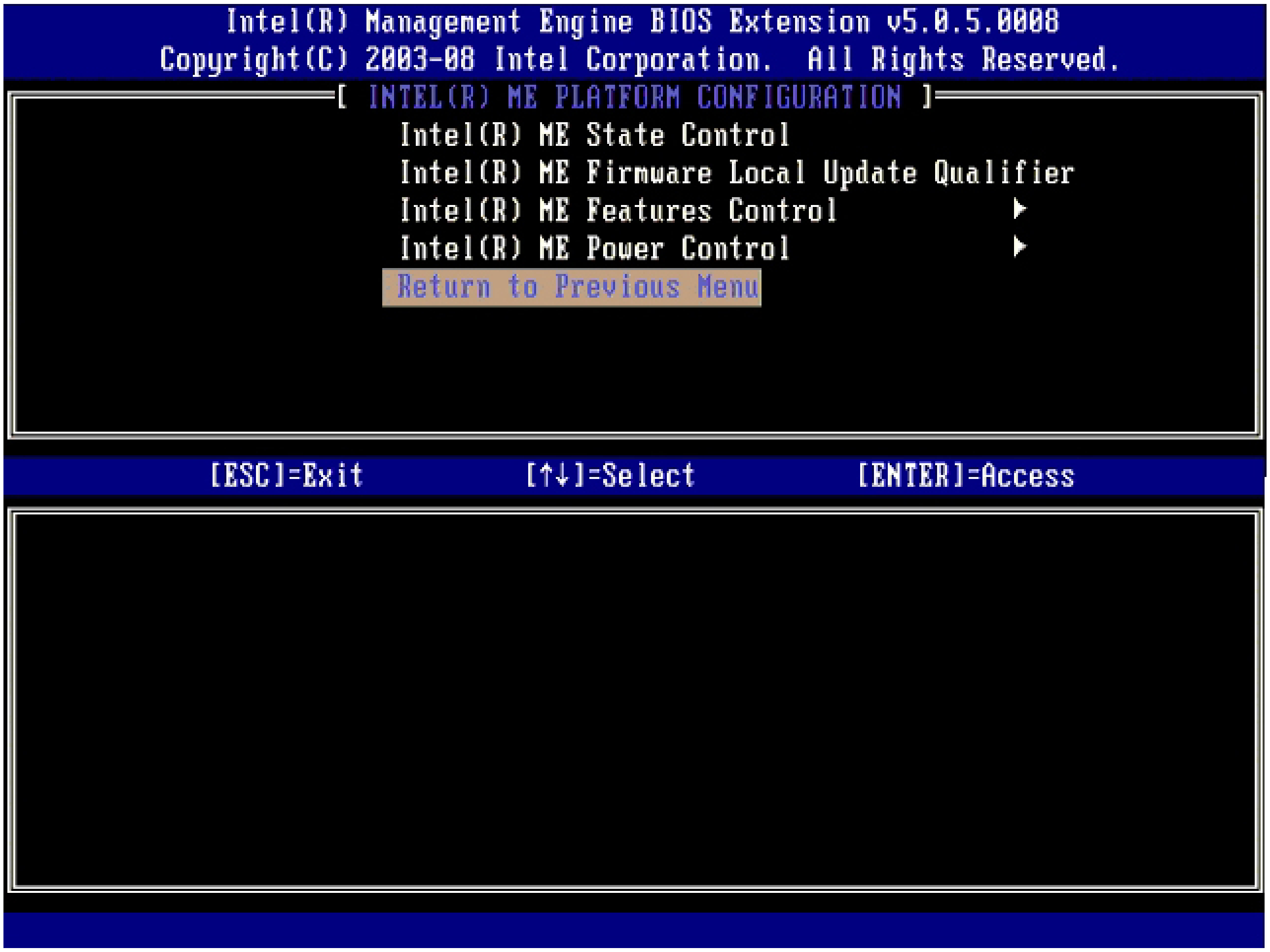
Intel ME ON in Host Sleep States is the next option. The default setting is **Mobile: ON in S0**.



13. Select **Return to Previous Menu** and then press <Enter>.



14. Select **Return to Previous Menu**, and then press <Enter>.



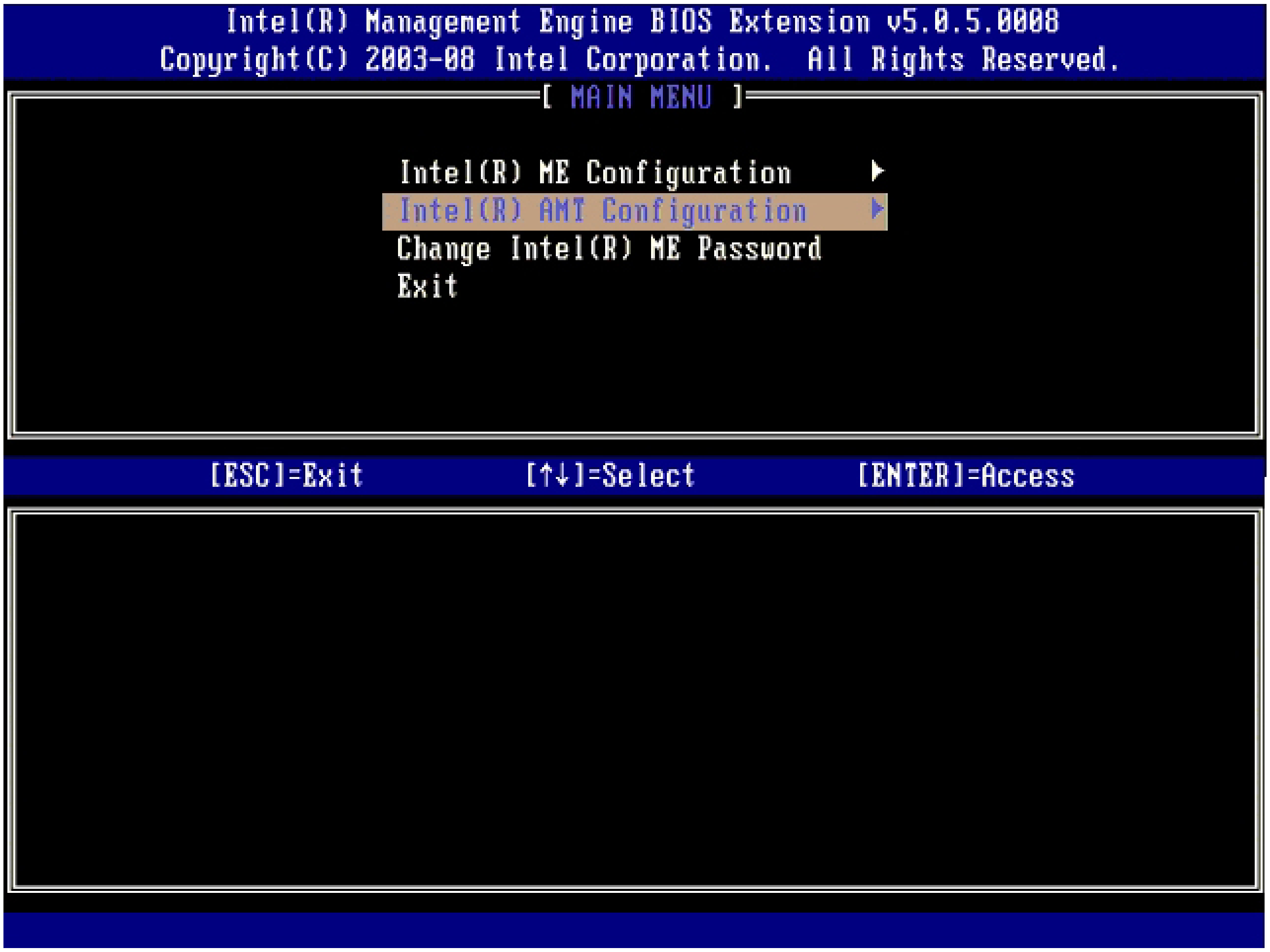
15. Exit the MEBx Setup and save the ME configuration.

    The computer displays an Intel ME Configuration Complete message and then restarts. After the ME configuration is complete, you can configure the Intel AMT settings.

Intel AMT Configuration

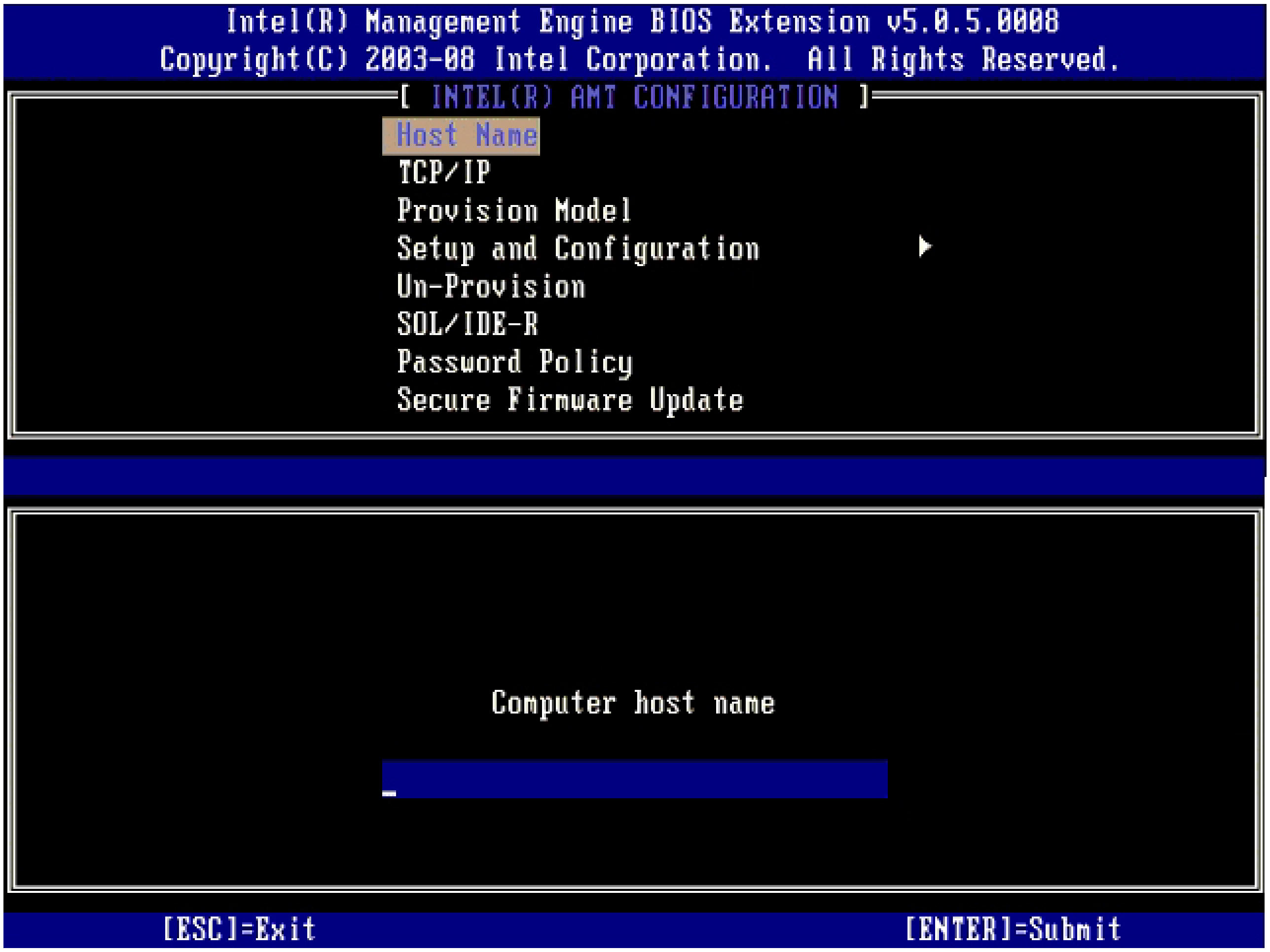
Enabling Intel AMT for SMB Mode

1. At the initial boot screen, press <Ctrl><p> to re-enter the MEBx screens.
2. When a prompt for the password appears, enter the new Intel ME password.
3. Select **Intel AMT Configuration**, and then press <Enter>.

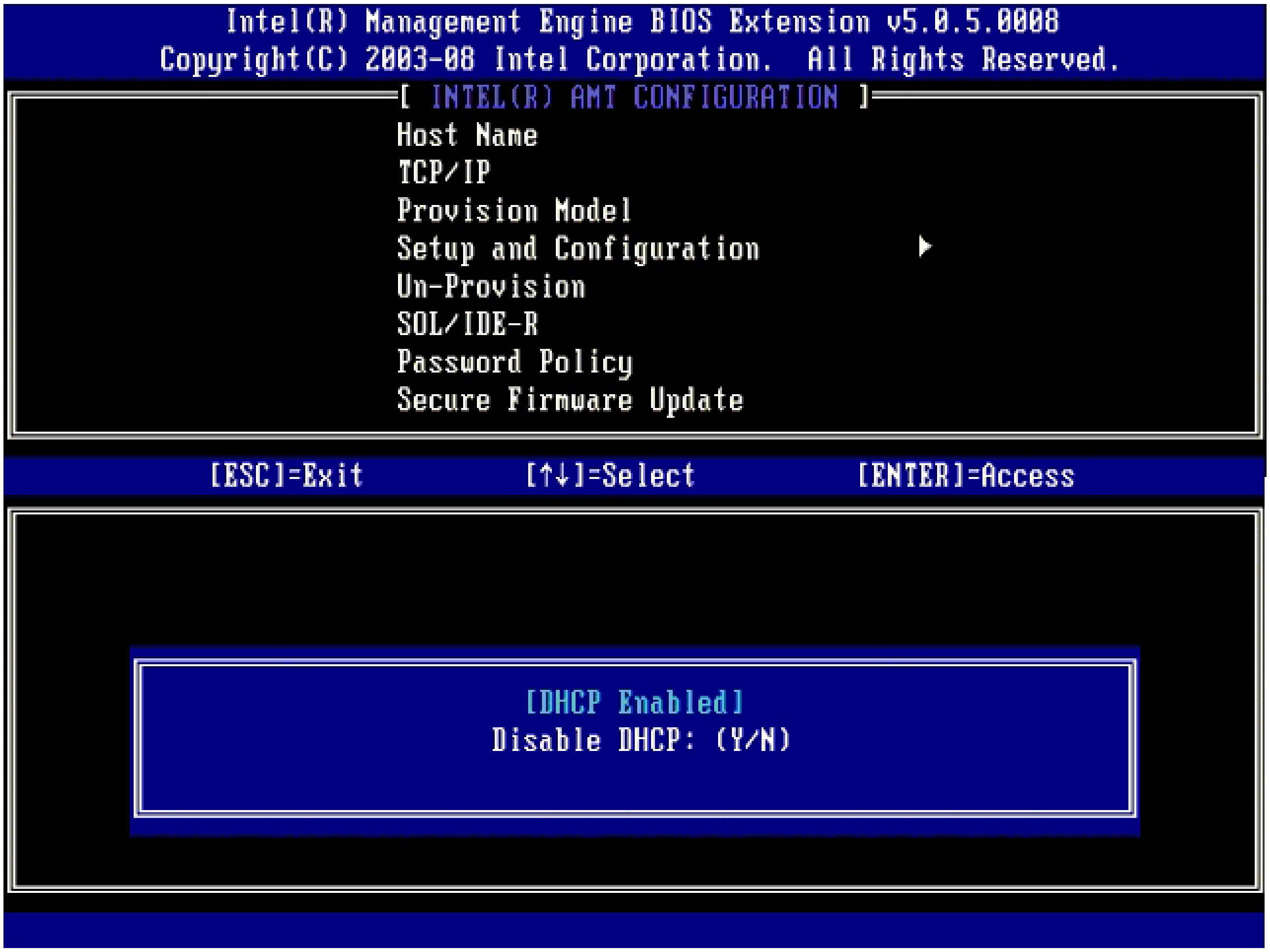


4. Select **Host Name**, and then press <Enter>.
5. Type in a unique name for this Intel AMT machine, and then press <Enter>.

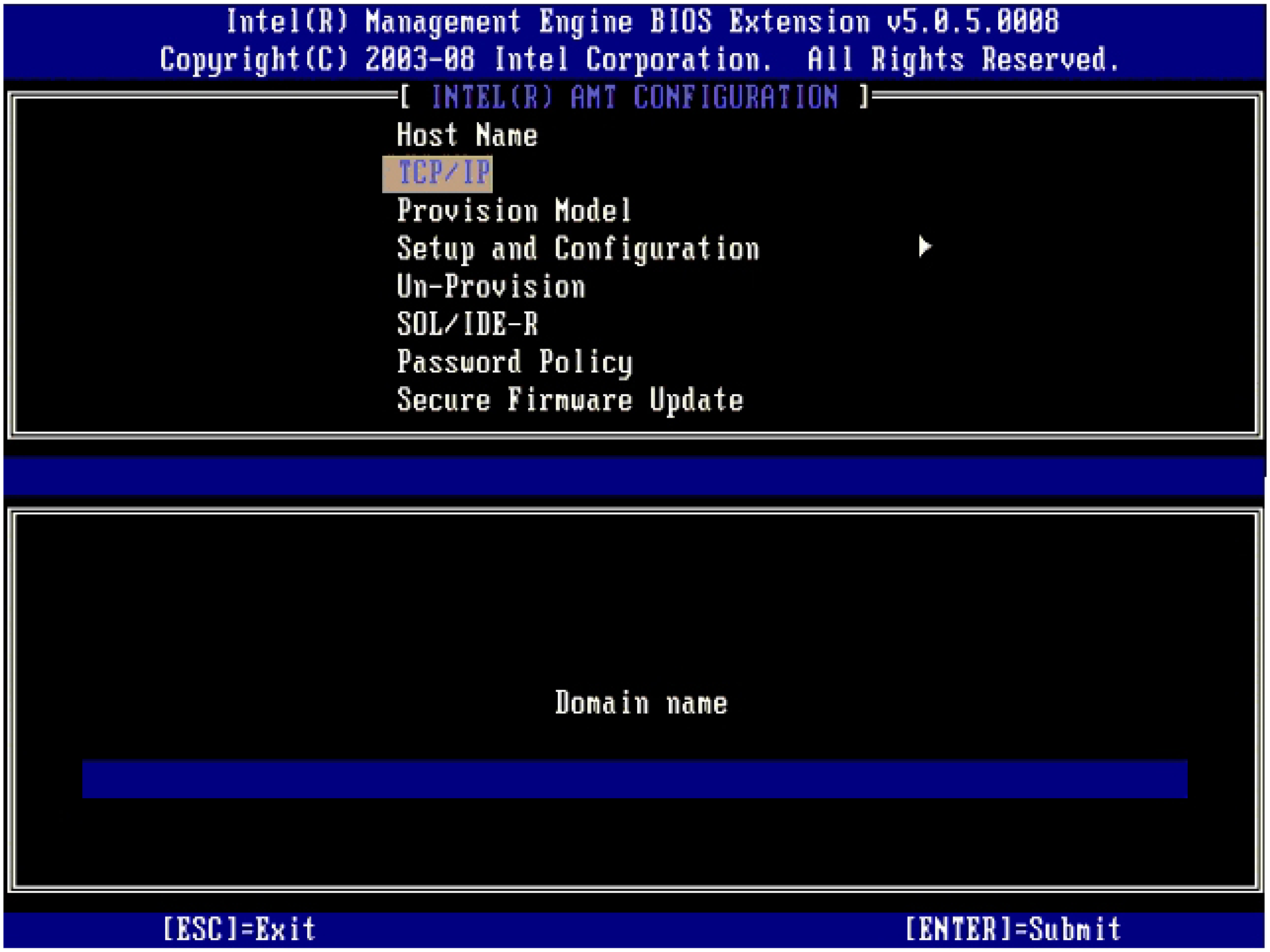
   Spaces are not accepted in the host name. Make sure there is not a duplicate host name on the network. Host names can be used in place of the computer's IP for any applications requiring the IP address.



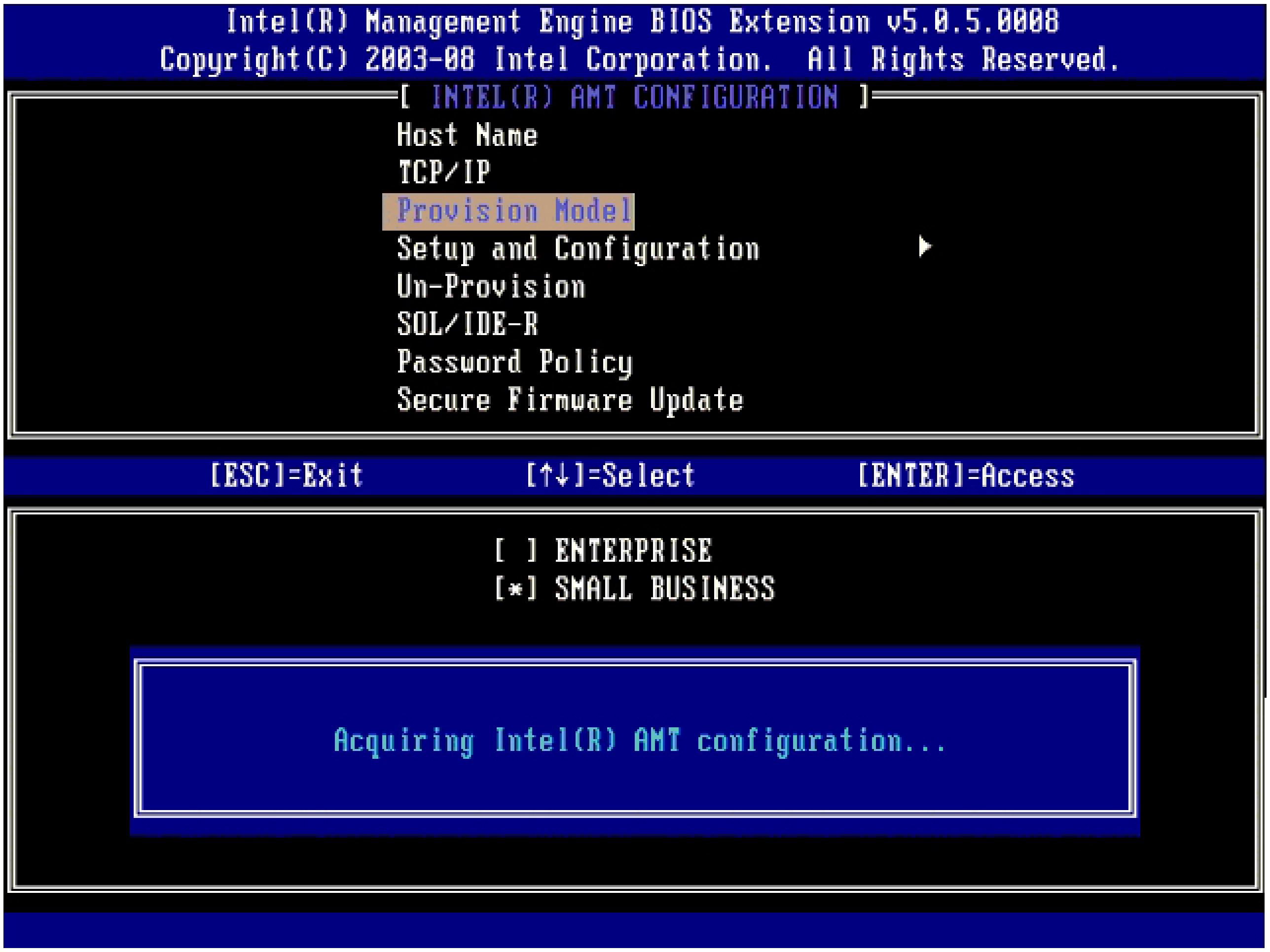
6. Select **TCP/IP**, and then press <Enter>.
7. Press <n> when the following message appears:
   - [DHCP Enable] Disable DHCP (Y/N)



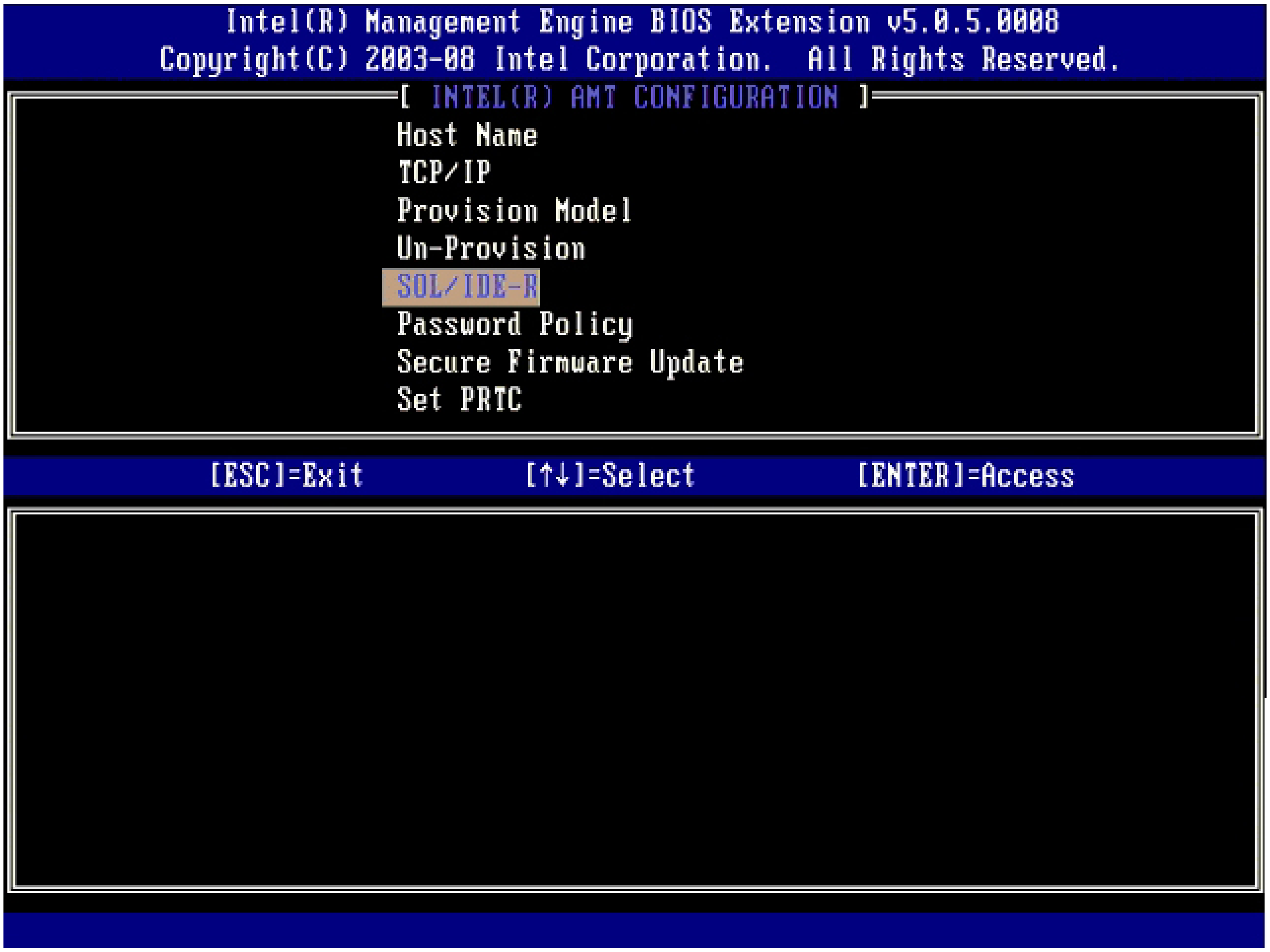
8. Type the domain name into the field.



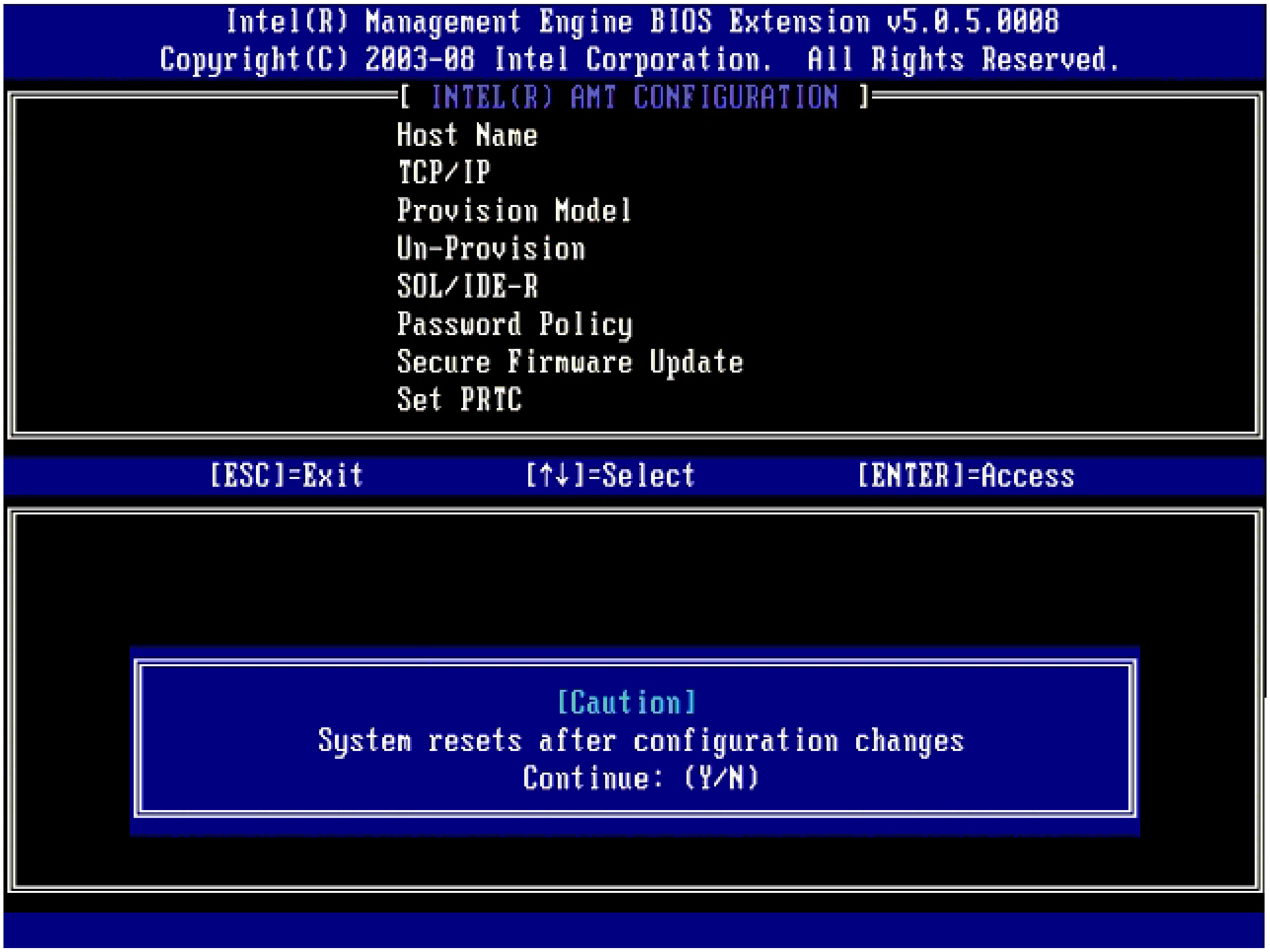
9. Select **Provision Model** from the menu, and then press <Enter>. This allows you to choose between an **Enterprise** or a **Small Business** configuration. The default setting is **Enterprise**.
10. Press <y> when the following message appears:



11. Skip the **Un-Provision** option. This option returns the computer to factory defaults. See the "Return to Default" section for more information about unprovisioning.
12. Select **SOL/IDE-R**. Press <Enter>.

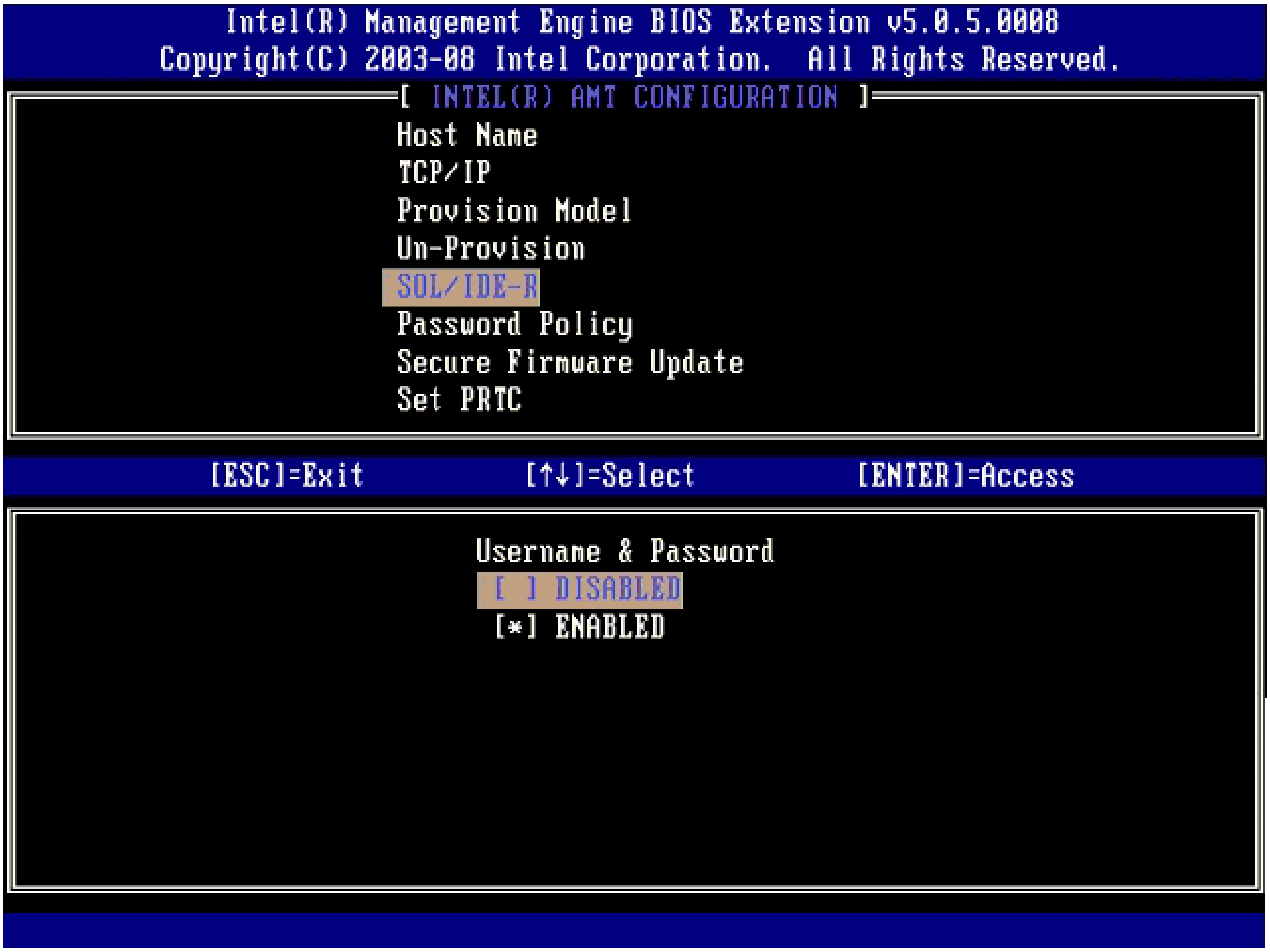


13. Press <y> when The following message appears:
    - `[Caution] System resets after configuration changes. Continue: (Y/N)`

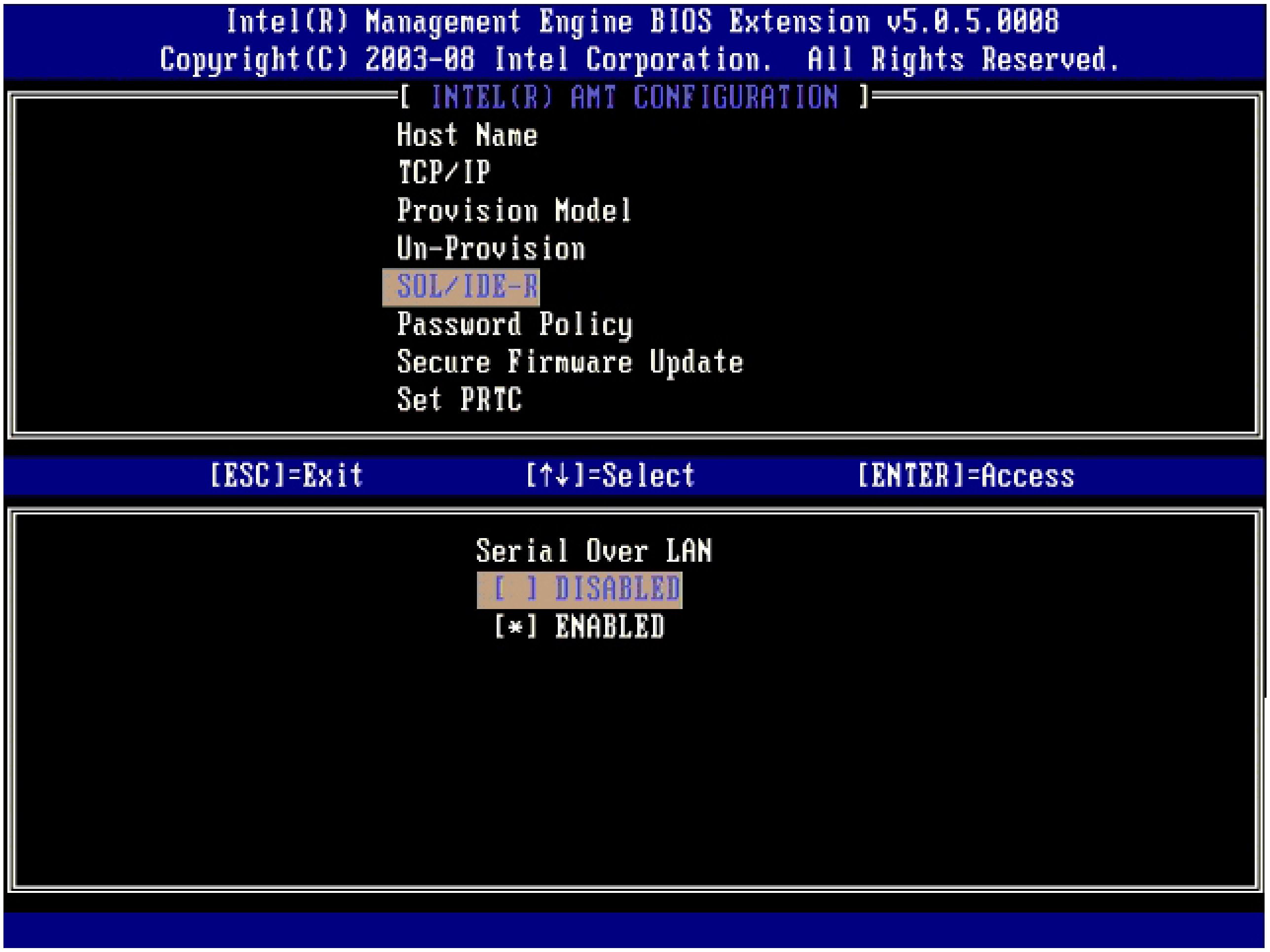


14. Select **Enabled** for **Username & Password**, and then press <Enter>.

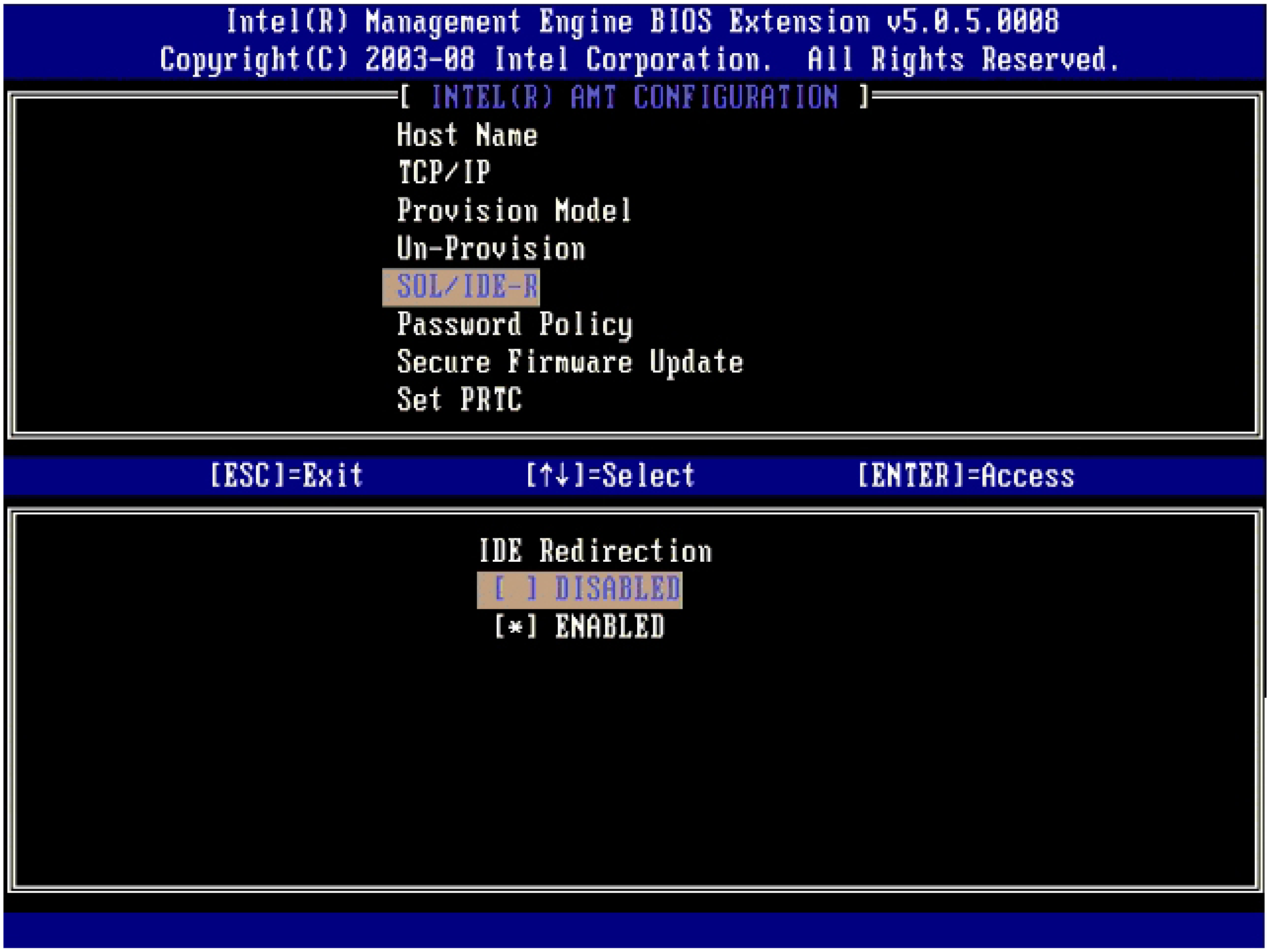
    This option allows you to add users and passwords from the WebGUI. If the option is disabled, then only the administrator has MEBx remote access.



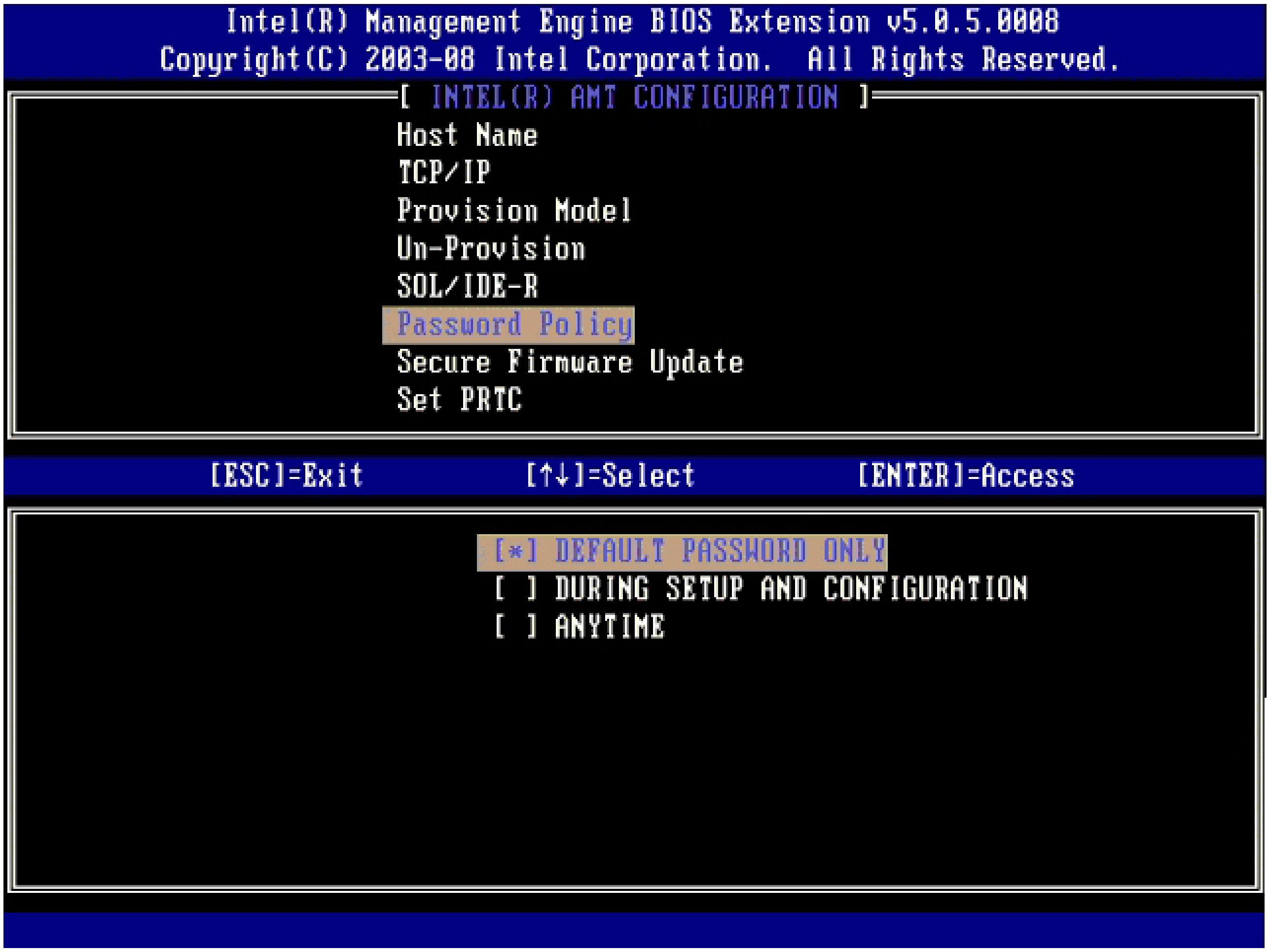
15. For **Serial Over LAN**, select **Enabled** and then press <Enter>.



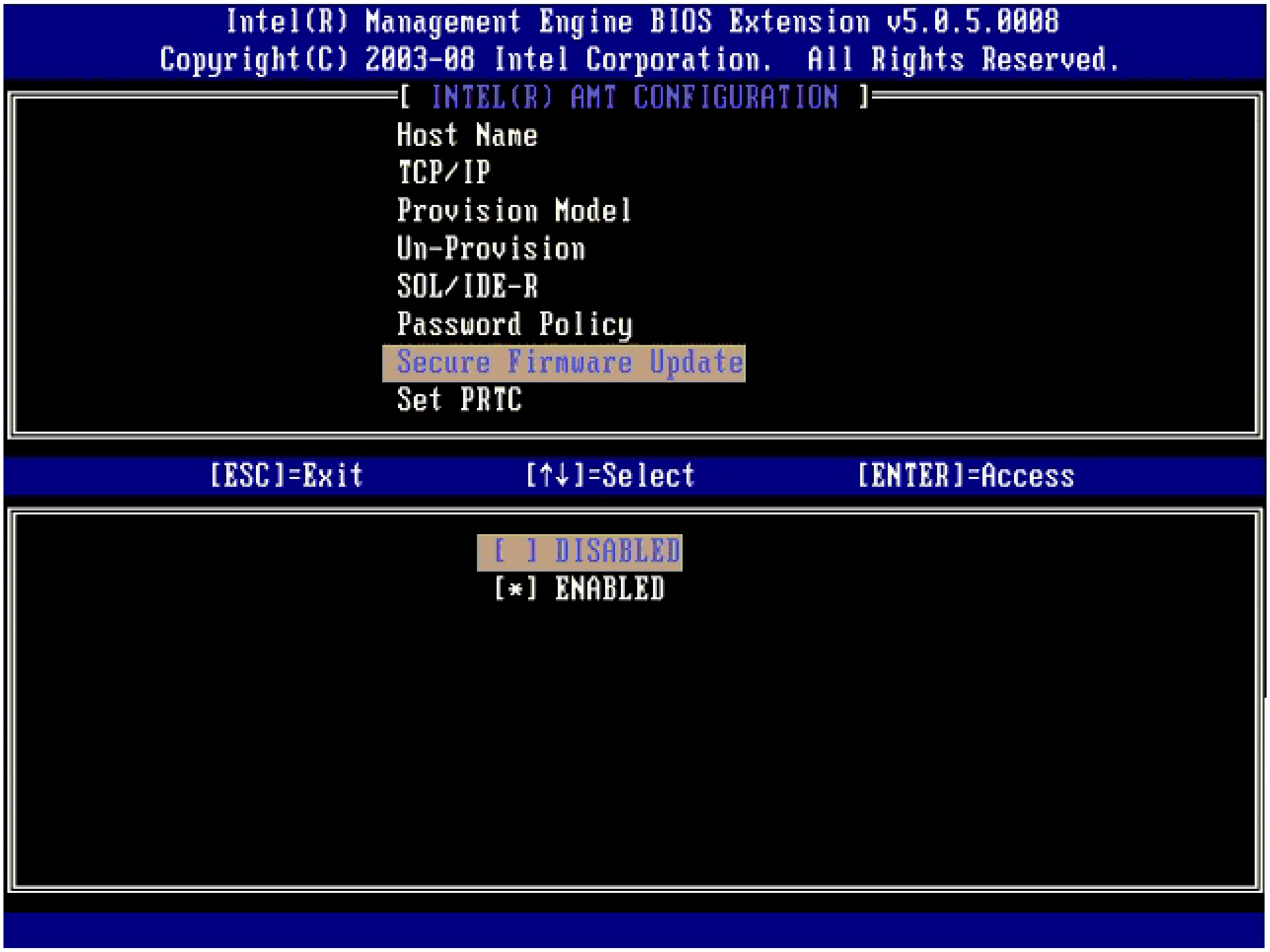
16. For **IDE Redirection**, select **Enabled** and then press <Enter>.



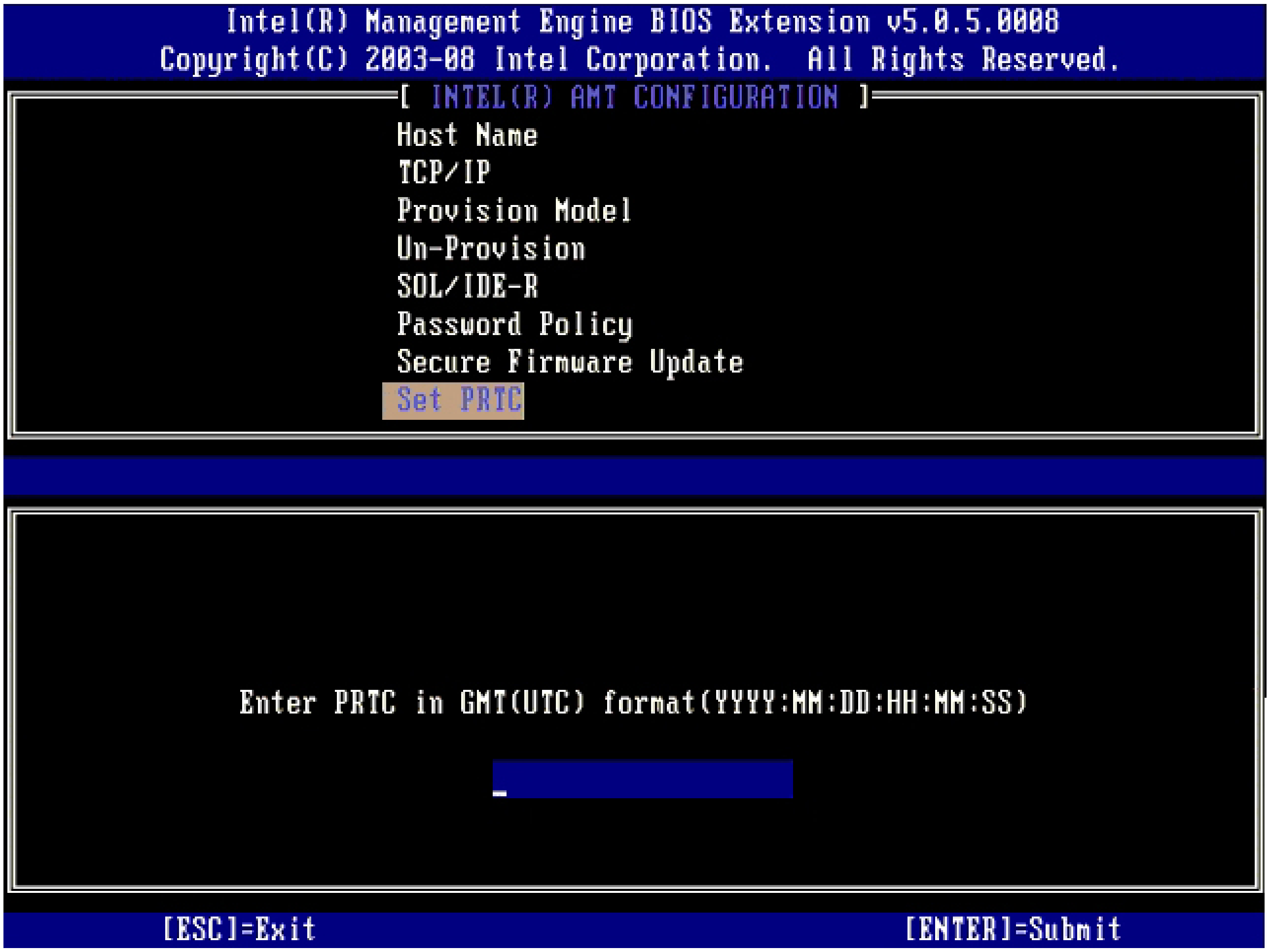
17. For **Password Policy**, select **Enabled** and then press <Enter>.



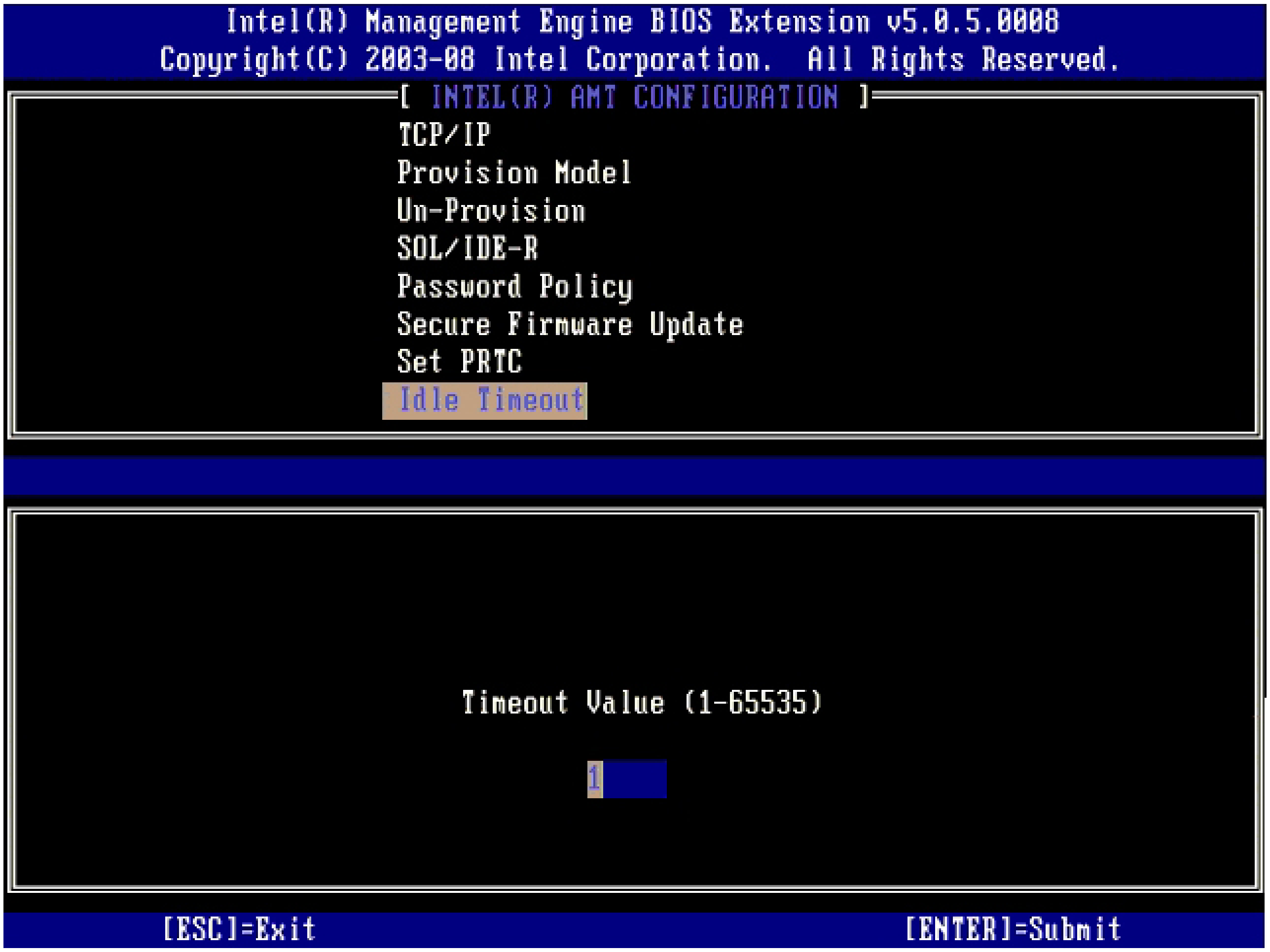
Secure Firmware Update is the next option. The default setting is **Enabled**.



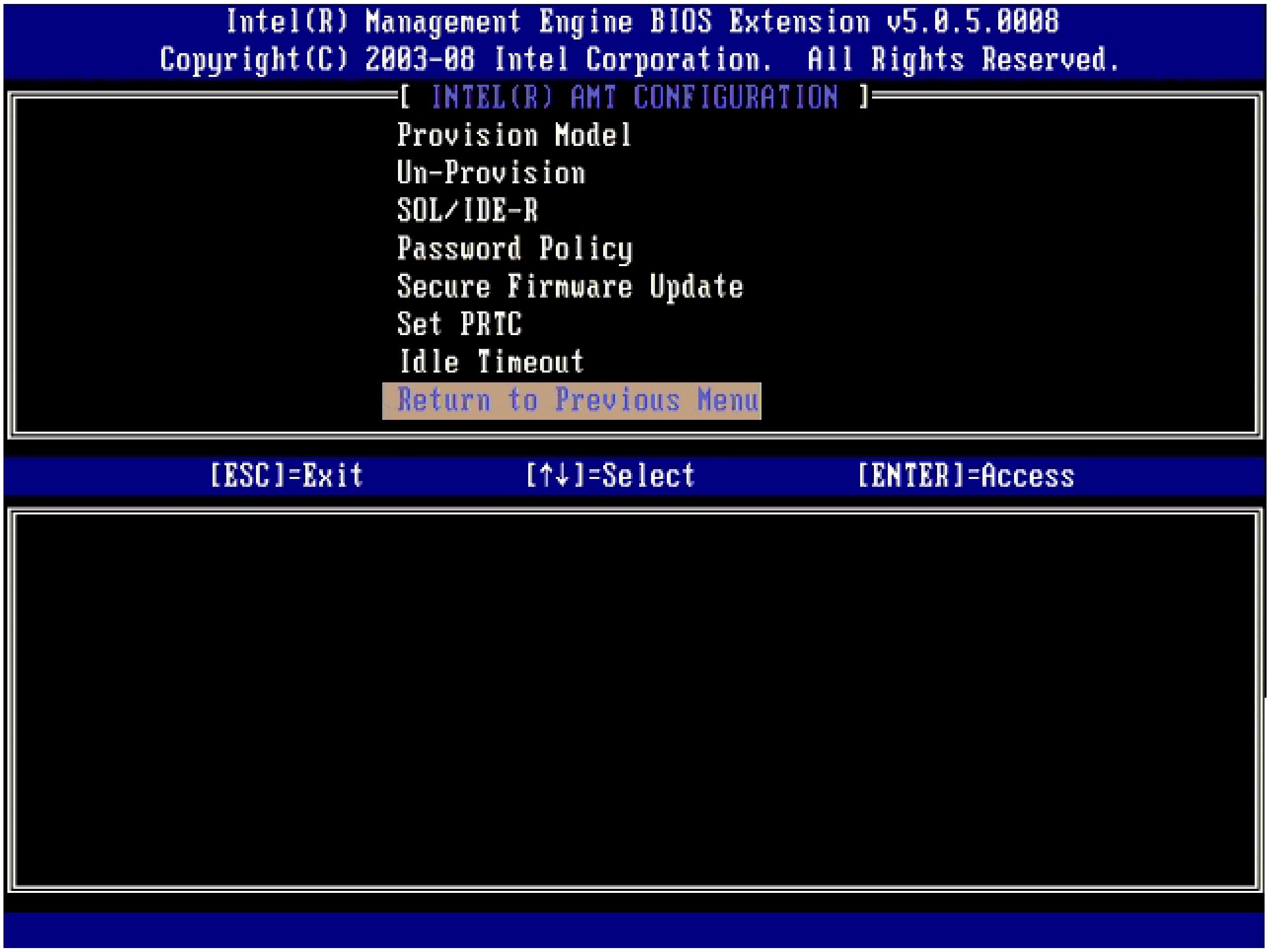
18. Skip **Set PRTC**.



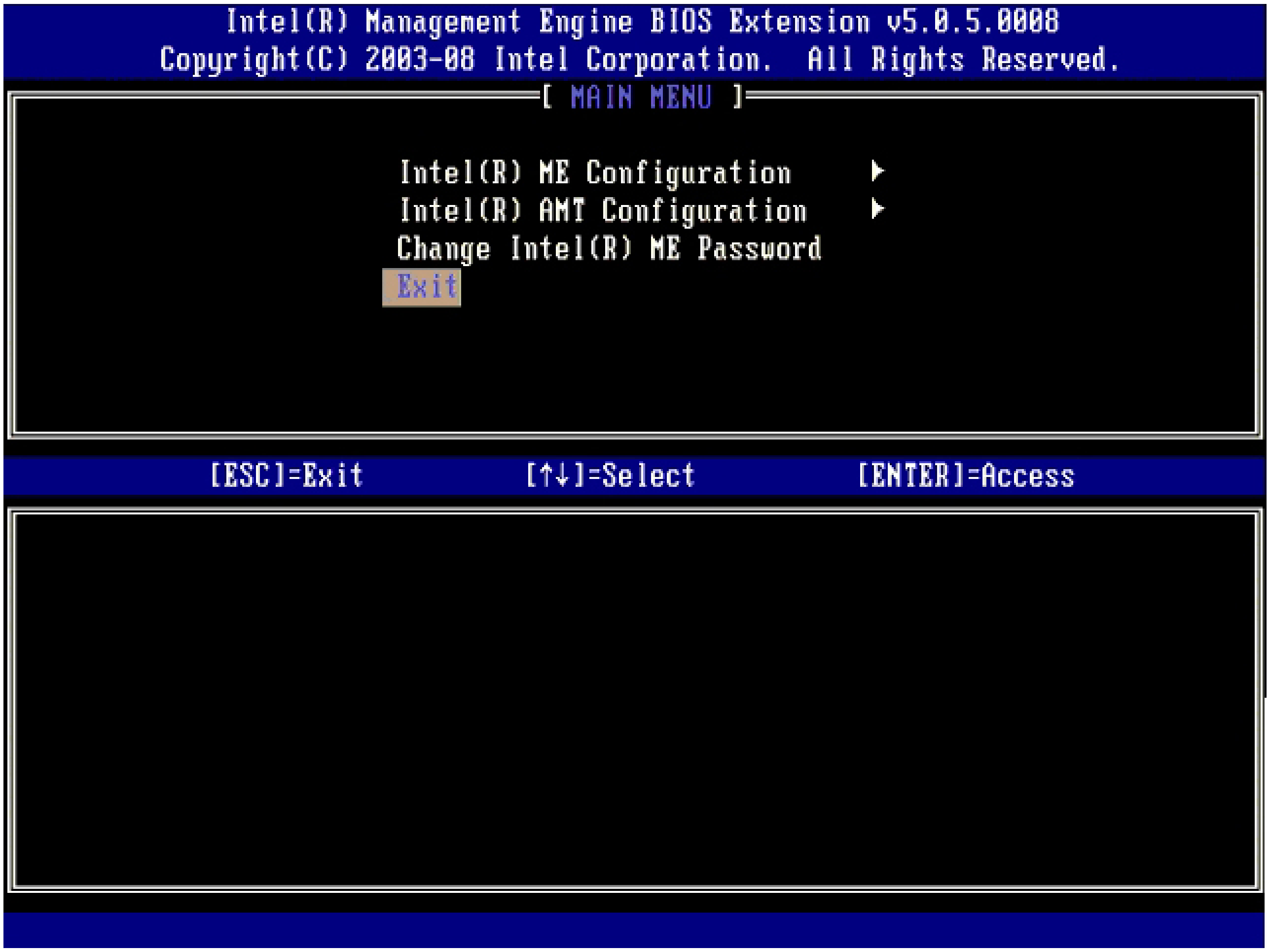
Idle Timeout is the next option. The default setting is **1**. This timeout is applicable only when a WoL option is selected for Intel ME ON in Host Sleep States screen of the process for enabling ME for the Enterprise operating mode.



19. Select **Return to Previous Menu**, and then press <Enter>.

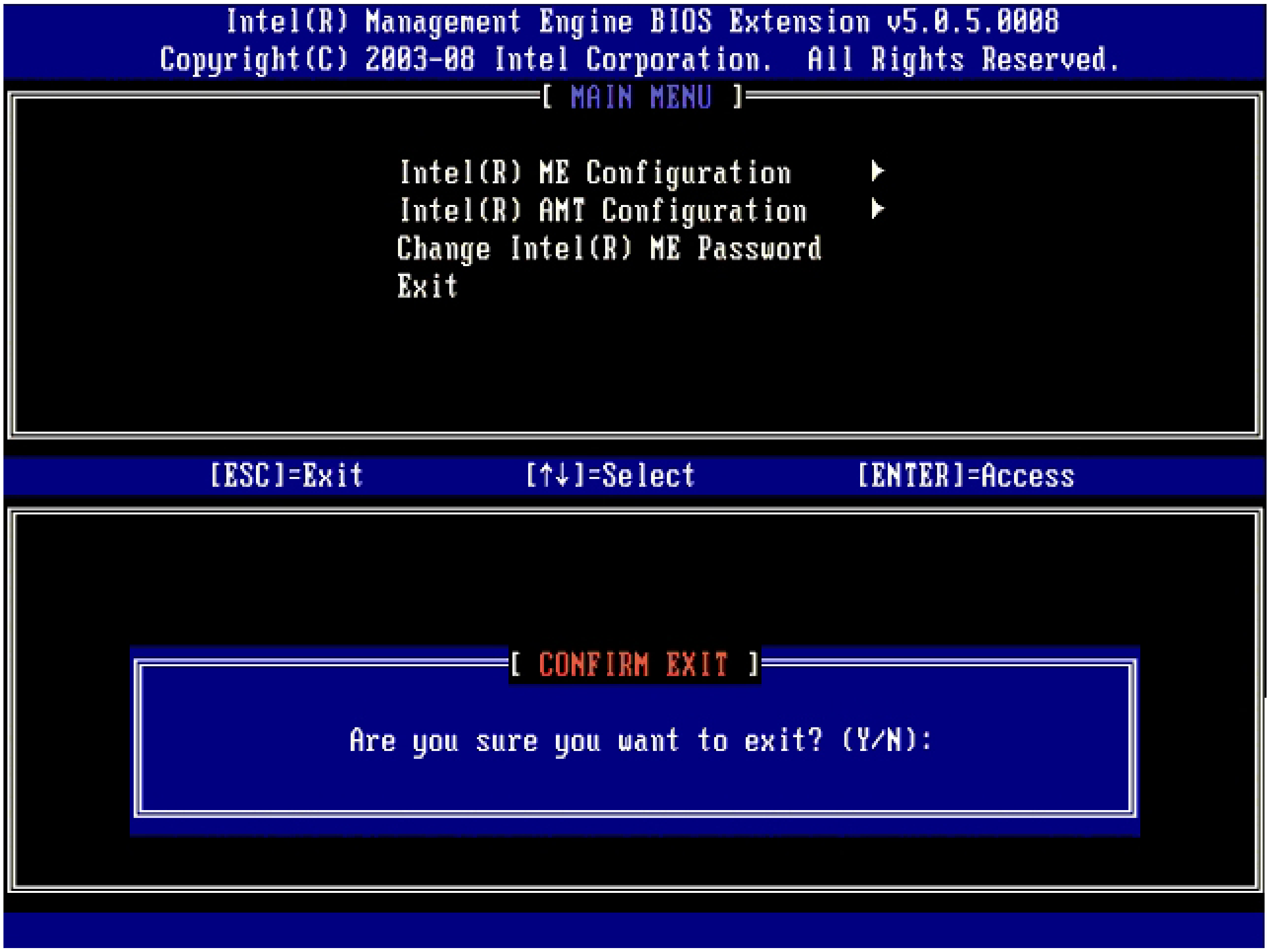


20. Select **Exit**, and then press <Enter>.



21. Press <y> when the following message appears:

    `Are you sure you want to exit? (Y/N):`



22. After the computer restarts, turn off the computer and disconnect the power cable.

    The computer is now in setup state and is ready for deployment.

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System Deployment

Once you are ready to deploy a computer to a user, plug the computer into a power source and connect it to the network. Use the integrated Intel® 82566DM NIC. Intel Active Management Technology (Intel AMT) does not work with any other NIC solution.

When the computer is turned on, it computer immediately looks for a setup and configuration server (SCS). If the computer finds this server, the Intel AMT capable computer sends a **Hello** message to the server.

DHCP and DNS must be available for the setup and configuration server search to automatically succeed. If DHCP and DNS are not available, then the setup and configuration servers (SCS) IP address must be manually entered into the Intel AMT capable computer's MEBx.

The **Hello** message contains the following information:

- Provisioning ID (PID)
- Universally Unique Identifier (UUID)
- IP address
- ROM and firmware (FW) version numbers

The **Hello** message is transparent to the end user. There is no feedback mechanism to tell you that the computer is broadcasting the message. The SCS uses the information in the **Hello** message to initiate a Transport Layer Security (TLS) connection to the Intel AMT capable computer using a TLS Pre-Shared key (PSK) cipher suite if TLS is supported.

The SCS uses the PID to look up the provisioning passphrase (PPS) in the provisioning server database and uses the PPS and PID to generate a TLS Pre-Master Secret. TLS is optional. For secure and encrypted transactions, use TLS if the infrastructure is available. If you do not use TLS, then HTTP Digest is used for mutual authentication. HTTP Digest is not as secure as TLS. The SCS logs into the Intel AMT computer with the username and password and provisions the following required data items:

- New PPS and PID (for future setup and configuration)
- TLS certificates
- Private keys
- Current date and time
- HTTP Digest credentials
- HTTP Negotiate credentials

The computer goes from the setup state to the provisioned state, and then Intel AMT is fully operational. Once in the provisioned state, the computer can be remotely managed.

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Operating System Drivers

Within the operating system, two drivers must be installed to remove unknown devices in the Device Manager. These drivers are discussed below.

SOL/LMS Driver

The Intel® AMT Serial-Over-LAN (SOL) / Local Manageability Service (LMS) driver is available on support.dell.com and on the ResourceCD under **Chipset Drivers**. The driver is labeled *Intel AMT SOL/LMS*. Once the driver is obtained, execute the file; it unzips and prompts the user to continue the installation process.

Once you install the SOL/LMS driver, the **PCI Serial Port** entry becomes the **Intel Active Management Technology - SOL (COM3)** entry.

HECI Driver

The Intel AMT Host Embedded Controller Interface (HECI) driver is available on support.dell.com and on the ResourceCD under **Chipset Drivers**. The driver is labeled *Intel AMT HECI*. Once the driver is obtained, execute the file; it unzips and prompts the user to continue the installation process.

Once you install the HECI drivers, the **PCI Simple Communications Controller** entry becomes the **Intel Management Engine Interface** entry.

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Intel AMT WebGUI

The Intel® AMT WebGUI is a Web browser-based interface for limited remote computer management. The WebGUI is often used as a test to determine if Intel AMT setup and configuration was performed properly on a computer. A successful remote connection between a remote computer and the host computer running the WebGUI indicates proper Intel AMT setup and configuration on the remote computer.

The Intel AMT WebGUI is accessible from any Web browser, such as the Internet Explorer® or Netscape® applications.

Limited remote computer management includes:

- Hardware inventory
- Event logging
- Remote computer reset
- Changing of network settings
- Addition of new users

WebGUI support is enabled by default for SMB setup and configured computers. WebGUI support for Enterprise setup and configured computers is determined by the setup and configuration server. Information on using the WebGUI interface is available on the Intel AMT website.

An older version of the WebGUI interface is available at Intel AMT Small Business Administrator's Guide under **Using the Web Browser Interface** on page 4.

Follow the steps below to connect to the Intel AMT WebGUI on a computer that has been configured and set up :

1. Turn on an Intel AMT capable computer that has completed Intel AMT setup and configuration.

2. Launch a Web browser from a separate computer, such as a management computer on the same subnet as the Intel AMT computer.

3. Connect to the IP address specified in the MEBx and port of the Intel AMT capable computer. (example: `http://ip_address:16992` or `http://192.168.2.1:16992`)
    - By default, the port is 16992. Use port 16993 and https:// to connect to the Intel AMT WebGUI on a computer that has been configured and set up in the Enterprise mode.
    - If DHCP is used, then use the fully qualified domain name (FQDN) for the ME. The FQDN is the combination of the host name and domain. (example: `http://host_name:16992` or `http://system1:16992`)

    The management computer makes a TCP connection to the Intel AMT capable computer and accesses the top level Intel AMT-embedded Web page within the Management Engine of the Intel AMT capable computer.

4. Type the username and password. The default username is `admin` and the password is what was set during Intel AMT setup in the MEBx.

5. Review the computer information and make any necessary changes.

You can change the MEBx password for the remote computer in the WebGUI. Changing the password in the WebGUI or a remote console results in two passwords. The new password, known as the remote MEBx password, only works remotely with the WebGUI or remote console. The local MEBx password used to locally access the MEBx is not changed. You have to remember both the local and remote MEBx passwords to access the computer MEBx locally and remotely. When the MEBx password is initially set in Intel AMT setup, the password serves as both the local and remote password. If the remote password is changed, then the passwords are out of sync.

6. Select **Exit**.

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AMT Redirection Overview

Intel® AMT makes it possible to redirect serial and IDE communications from a managed client to a management console regardless of the boot and power state of the managed client. The client need only have the Intel AMT capability, a connection to a power source, and a network connection. Intel AMT supports Serial Over LAN (SOL, text/keyboard redirection) and IDE Redirection (IDER, CD-ROM redirection) over TCP/IP.

Serial Over LAN Overview

Serial Over LAN (SOL) is the ability to emulate serial port communication over a standard network connection. SOL can be used for most management applications where a local serial port connection is normally required.

When an active SOL session is established between an Intel AMT-enabled client and a management console using the Intel AMT redirection library, the client's serial traffic is redirected through Intel AMT over the LAN connection and made available to the management console. Similarly, the management console may send serial data over the LAN connection that appears to have come through the client's serial port.

IDE Redirection Overview

IDE Redirection (IDER) is capable of emulating an IDE CD drive or a legacy floppy or LS-120 drive over a standard network connection. IDER enables a management machine to attach one of its local drives to a managed client over the network. Once an IDER session is established, the managed client can use the remote device as if it were directly attached to one of its own IDE channels. This can be useful for remotely booting an otherwise unresponsive computer. IDER does not support the DVD format.

For example, IDER is used to boot a client with a corrupt operating system. First, a valid boot disk is loaded into the management console disk drive. This drive is then passed as an argument when the management console opens the IDER TCP session. Intel AMT registers the device as a virtual IDE device on the client, regardless of its power or boot state. Both SOL and IDER may be used together since the client BIOS may need to be configured to boot from the virtual IDE device.

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Troubleshooting

This page describes a few basic troubleshooting steps to follow if problems are experienced with the Intel® AMT configuration. Remember to always check DSN for more troubleshooting options.

Return to Default

Return to default is also known as un-provisioning. An Intel AMT setup and configured computer can be un-provisioned using the Intel AMT Configuration screen and the **Un-Provision** option.

Follow the steps below to un-provision a computer:

1. Select **Un-Provision** and then select **Full Un-provision**.

   Full un-provisioning is available for SMB Mode provisioned computers. This option returns all Intel AMT configuration settings to factory defaults and does NOT reset ME configuration settings or passwords. Full and partial un-provisioning is available for Enterprise Mode provisioned computers. Partial un-provisioning returns all Intel AMT configuration settings to factory defaults with the exception of the PID and PPS. Partial un-provisioning does NOT reset ME configuration settings or passwords.

   An un-provisioning message displays after about 1 minute. After un-provisioning completes, control is passed back to the Intel AMT Configuration screen. **Provisioning Server**, **Set PID and PPS**, and **Set PRTC** options are available again because the computer is set to the default Enterprise Mode.

2. Select **Return to previous menu**.
3. Select **Exit** and then press <y>.

   The computer restarts.

Firmware Flash

Flash the firmware to upgrade to newer versions of Intel AMT. The automatic flash feature can be disabled by selecting **Disabled** under the **Secure Firmware Update** setting in the MEBx interface. If this setting is disabled, a firmware error message appears when flashing the BIOS.

The firmware CANNOT be flashed to an older version or to the current version installed. The firmware flash, when available, is located on the support.dell.com site for download.

Serial-Over-LAN (SOL) / IDE Redirection (IDE-R)

If you cannot use IDE-R and SOL, follow these steps:

1. At the initial boot screen, press <Ctrl><p> to enter the MEBx screens.
2. When a prompt for the password appears, enter the new Intel ME password.
3. Select **Intel AMT Configuration**, and then press <Enter>.
4. Select **Un-Provision**, and then press <Enter>.
5. Select **Full Unprovision**, and then press <Enter>.
6. Reconfigure the settings under the **Intel AMT Configuration** menu option shown here.

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